



**Region of Waterloo**

**84 Frederick Street Renovations  
Kitchener, Ontario**

**T2025-116**

**TENDER SPECIFICATIONS**

**Fall 2024**

**Volume 1 of 1**

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Each section of this Specification is numbered to conform to CSA/CSC MASTERFORMAT arranged in the 50 Division 6 digit Format. The Sections are written as units of Work and have been assigned particular numbers. They are arranged in sequence for this particular Contract. Any gaps in the order of numerical sequence do not indicate that a Specification Section has been inadvertently omitted but, rather, that a Section is not included in the Specification for this Contract.

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**END OF SECTION**

## **1. GENERAL**

1. The Contractor shall thoroughly review all sections and divisions of the specification, and the drawings, to ensure that work of this section is understood together with all related items of the Contract.
2. Thorough investigation of existing conditions through examination of the Project Site, Place of the Work, areas which are affected by the Work, examination of documentation made available by the Owner for inspection, and requirements of authorities having jurisdiction for the Project Site and Work, is the sole responsibility of the Bidder.
3. Attendance at the Bidder's Site Meeting is not mandatory for the Bidder. Notwithstanding, the act of submitting a Bid is an acknowledgement that the Bidder has examined all relevant areas of the Project Site, Place of the Work, available documentation and/or reports, and requirements of authorities having jurisdiction over the Project Site and the Work, and that the Bid incorporates all items which can be reasonably inferred from such examination.

## **2. OWNER'S USE AND ENJOYMENT OF PROPERTY DURING CONTRACT TIME**

1. The Owner's requirements for use and enjoyment of the property where the Work is being performed during the Contract Time, and the Owner's requirements for scheduling of specific portions of the Work in order to facilitate use and enjoyment of portions of the property during the Contract Time, as outlined on attached documentation referenced by this Section, and as shown on drawings for possible construction sequencing, constitute existing conditions of the Work that the Bidder must incorporate into the Bidder's design for the accomplishment of the Work, the Bid Price, and ways and means that the Contractor must use to accomplish the Work.
2. Any further clarification of the Owner's requirements for use and enjoyment noted or referenced in this Section are to be solicited and obtained by the Bidder during the tendering period for this Contract, and shall be incorporated by the Bidder in the ways and means proposed for the performance of the Work. The act of submitting an Offer constitutes acknowledgement by the Bidder that all such information relevant to the Contractor's proposed means and methods for performance of the Work has been solicited, received, and incorporated by the Bidder into the offered Price and Contract Time.
3. All power supply systems and life safety systems, including fire fighter's connections on adjacent properties, must be protected and remain functional throughout the construction period. Existing power systems may only be interrupted with special permission of the Owner for short periods required to make service connections after hours.

## **3. SUBSURFACE AND EXISTING CONDITIONS, REFERENCE DOCUMENTS**

1. All information relating to subsurface and existing conditions on the project property with respect to the Work must be obtained by the Bidder directly from personal inspection of the site and examination of all reference documents and information identified in The Documents.
2. The Owner acknowledges that the Contractor's direct inspection of the site, existing conditions, and reference documentation cannot, by its nature, reveal all conditions that exist or can occur to affect the Work. Should such conditions be found to vary substantially from conditions anticipated by the Consultant in the design, or reasonably inferable by the Contractor from the design, examination of the reference documents and information, or its inspection of the Project site, Place of the Work and existing conditions, then changes in the design and construction of the Work will be made, with resulting changes to Contract Time and Contract Price in accordance with provisions for such changes.

3. The Contractor is responsible for thorough inspection of subsurface and existing conditions as Work proceeds, and notification of the Consultant when such conditions may vary from conditions anticipated by the design and the Contract Documents.

#### **4. CLIMATIC DATA**

1. Climatic data and meteorological information is obtainable from Environment and Climate Change Canada. Where the Contractor determines in the course of the preparation of its tender bid that climate may affect in any manner the ways and means for performance of the Work as proposed by the Contractor, it shall thoroughly examine the climatic data for the last 10 (ten) year period at Environment and Climate Change Canada reporting station nearest the Site, and incorporate all information reasonably inferable from such data into the Offer, Contract Price, Construction Schedule, and Contract Time.
2. No change to the Contract Price or Contract Schedule will be considered for the effect of climate or weather conditions unless such conditions can be reasonably determined by the Consultant to be at significant variance from the norms of the last 10 year period, and that such variance clearly affects portions of the Work and the Construction Schedule adversely.

#### **5. HAZARDOUS SUBSTANCES, DANGEROUS GOODS AND/OR PROCESSES**

1. The Owner and Consultant are aware of the presence of hazardous materials and designated substances in locations of the existing building that may affect the Work of this Contract. The Owner and Consultant are not aware of subsurface contamination conditions in the area of the proposed siteworks and existing building that will be affected by the Work of this Contract.

Neither the Owner nor the Consultant have made careful investigation of the property for the possible presence of such designated substances or hazardous materials in locations that may affect the Work, except as otherwise noted in the Reference Documents.

2. The Contractor is solely responsible for information regarding hazardous materials or designated substances reasonably inferred from careful inspection of the project Site, Place of the Work, and reference documentation made available for the Contractor's examination. In submitting a Tender, the Contractor acknowledges that all work required by the presence of materials whose presence is reasonably inferred from the examinations noted above is incorporated in the Tender Price, Contract Time, and Contract Schedule.
3. Prior to submitting a Tender for the Work, the Bidder shall investigate requirements for aspects of the work, including but not limited to: caulking; painting and finishing; adhering; use of materials which involve a curing process during their installation; heating; burning or welding; generation of noise, dust, or air- or liquid-borne by-products; use of solvents or volatile materials; or any other process, material or Product likely to generate hazardous substances and shall incorporate into the offer all procedures for performance of these aspects of the Work required by authorities having jurisdiction, common knowledge and practice, the Documents, and/or reasonable inference.
4. The Contractor is to supply Products and perform work with diligent regard for the safety and protection of the work force, the Owner's staff, the Facility and Owner's property, and the public from methods, materials, Products, and substances noted above, in all locations of manufacture, delivery, installation and intended use. In submitting a Tender, the Bidder acknowledges that all work required by the presence of substances noted above and/or means of production or performance of the Work is incorporated in the Tender Price, Contract Time, and Contract Schedule.

#### **END OF SECTION**

## 1. GENERAL

### 1. The Documents

1. The Documents include all Owner's bid forms (including but not limited to Instructions to Bidders, Bid Forms, Supplemental General Conditions, Modifications to Articles and Definitions, Special Provisions, Appendices, etc.), Drawings, Specifications Divisions 00 to 49 inclusive, and addenda, all as listed below.
2. Only the electronic copy of the Documents and the electronic copy of addenda as uploaded by the *Owner* to its electronic bidding system website, constitute the Documents.
3. All other versions of documents are only informal copies.

### 2. Contract Documents

1. The *Contract Documents* are defined in accordance with Document CCDC 2-2020 Article A-3, as modified in the Documents, and are additionally listed in this Section.
2. Upon award of *Contract*, the *Owner* will prepare *Contract Documents* for signing which include but is not limited to the completed Bid Forms, all completed Supplementary Forms, all Addenda to the Tender, all items referenced in Article A-3 of the CCDC 2-2020 as defined in the Definitions therein referenced, and all drawings and specifications noted in this Section. The act of bidding constitutes acceptance by the bidder that the above noted documents will be included in the *Contract*, together with such other documents as determined by the *Owner*. The *Owner* is not bound by this condition.
3. Instructions to Bidders do not form a part of the *Contract Documents*, except as otherwise noted.

## 2. LIST OF DOCUMENTS

### 1. Drawings and Specifications

1. The following list of drawings and specifications are titled "RoW – 84 Frederick St. Renovations" and noted as issued for purpose "T, For Tender, Dec. 19 '24".
2. The drawings consist of forty-one (41) 24" by 36" Architectural drawings as follows:

A001	General Notes and Cover
A011	OBC Matrix & Information
A012	WC Accessories OBC Requirements
A021	Assembly Types
A031	Construction Sequencing Plan
A121	Site Plan
A201	Basement Removals Plan
A202	Ground Floor Removals Plan
A203	Second Floor Removals Plan
A204	Third Floor Removals Plan
A205	Roof Removals Plan
A211	Basement Plan
A212	Ground Floor Plan
A213	Second Floor Plan
A214	Third Floor Plan
A215	Roof Plan
A231	Basement Floor Finishes Plan
A232	Ground Floor Finishes Plan
A233	Second Floor Finishes Plan
A234	Third Floor Finishes Plan
A301	Building Elevations
A302	Building Elevations

List of Documents

A303	Building Elevations
A321	Window Coverings Schedule
A501	Basement Reflected Ceiling Plan
A502	Main Floor Reflected Ceiling Plan
A503	Second Floor Reflected Ceiling Plan
A504	Third Floor Reflected Ceiling Plan
A701	Stair Plans, Sections and Details
A702	Stair Plans, Sections and Details
A711	Millwork Schedule
A712	Millwork Details
A901	Basement Openings Schedule
A902	Ground Floor Schedule
A903	Second Floor Openings Schedule
A904	Third Floor Openings Schedule
A911	Basement Room Finishes Schedule
A912	Ground Floor Room Finishes Schedule
A913	Second Floor Room Finishes Schedule
A914	Third Floor Room Finishes Schedule
A921	Owner Equipment Schedule

3. Further to the above, the Architectural drawings include the following twenty-six (26) 8.5"x11" Section Detail drawings, bound separately:

1-B215	Section Detail @ Mech. Room
2-B215	Section Detail @ Mech. Room at t.o. Wall
3-B215	Section Detail @ Mech. Room at b.o. Wall
4-B215	Section Detail @ Door Sill
5-B215	Section Detail @ Exterior Wall
6-B215	Section Detail @ Mech. Room at Parapet
7a-B215	Section Detail @ Parapet
7b-B215	Section Detail @ Scupper
8a-B215	Section Detail @ Lower Roof @ Base of Wall
8b-B215	Section Detail @ Lower Roof @ Scupper Outlet
9a-B215	Section Detail @ Lower Roof @ Parapet
9b-B215	Section Detail @ Lower Roof @ Scupper
10-B215	Section Detail @ Sloped Roof @ Roof Edge
11-B215	Section Detail @ Sloped Roof @ Roof Peak
12-B215	Section Detail @ Sloped Roof @ RTU Curb
13-B215	Section Detail @ Sloped Roof @ Eave
14-B215	Section Detail @ Sloped Roof @ New Parapet
15-B215	Section Detail @ North Wing Roof @ Low Parapet
16-B215	Section Detail @ North Wing Roof @ High Parapet
17-B215	Section Detail @ North Wing @ New Roof Drain
18-B215	Section Detail @ Community Room @ Parapet
19-B215	Section Detail @ Community Room @ Window
20-B215	Section Detail @ Community Room Roof @ Roof Drain
21-B215	Section Detail @ Planter
22-B215	Section Detail @ Breezeway South Side
23-B215	Section Detail @ Breezeway North Side

4. Further to the above, the drawings include fourteen (14) 24" x 36" Mechanical (M) drawing as follows:

M001	Mechanical General Notes
M101	Basement Plumbing Plan
M102	Ground Floor Plumbing Plan
M103	Second Floor Plumbing Plan
M104	Third Floor Plumbing Plan
M201	Basement Hydronic Heating System Plan

List of Documents

M202	Ground Floor Hydronic Heating System Plan
M203	Second Floor Hydronic Heating System Plan
M204	Third Floor Hydronic Heating System Plan
M301	Basement HVAC Plan
M302	Ground Floor HVAC Plan
M303	Second Floor Floor HVAC Plan
M304	Third Floor HVAC Plan
M305	Roof HVAC Plan

5. Further to the above, the drawings include twelve (12) 24" x 36" Electrical (E) drawing as follows, noted as "Issued for Permit & Tender" and dated "2024.12.19":

E1	Lighting Basement - RCP
E2	Lighting Ground Floor - RCP
E3	Lighting Second Floor - RCP
E4	Lighting Third Floor - RCP
E5	Power & Communications Basement – Floor Plan
E6	Power & Communications Ground Floor – Floor Plan
E7	Power & Communications Second Floor – Floor Plan
E8	Power & Communications Third Floor – Floor Plan
E9	Fire Alarm & Life Safety Basement - RCP
E10	Fire Alarm & Life Safety Ground Floor - RCP
E11	Fire Alarm & Life Safety Second Floor - RCP
E12	Fire Alarm & Life Safety Third Floor - RCP

6. The Specifications consists of Sections as listed in Section 000000 - List of Contents bound herein and as noted on the Drawings wherever stated as Specifications.

### 3. REFERENCE DOCUMENTS

1. In conjunction with the Contract Documents, all reference documents as listed in the Owner's appendices to the Bid Documents shall be inspected and examined by the Bidder prior to bid submission, so that all requirements resulting from the conditions of service and coordination with the facility expansion project are incorporated by the Proponent into the design and installation of the Products, the execution and performance of the Work, and the design of the ways and means for accomplishing the Work and the Contract Time. The reference documents consist of:

1. The existing "YWCA Renewal 84 Frederick Street" building drawings, as prepared by The Walter Fedy Partnership, as "Issued for Building Permit" dated February 12, 2006, and consisting of eighty-five (85) drawings, formatted for 24"x36" plotting. These drawings include but are not necessarily limited to site, architectural, structural, mechanical, electrical, and landscape disciplines.

The Contractor is cautioned that these drawings do not necessarily represent the as-built condition. Where there are discrepancies between these Reference Documents and the Tender Documents, and the existing conditions, the more stringent or onerous condition shall govern. Job check all conditions.

2. The "Designated Substances and Hazardous Building Materials Assessment Final Report YWCA Kitchener-Waterloo, Emergency Shelter 84 Frederick Street, Kitchener, Ontario" as prepared for the Region of Waterloo by Access Environmental Solutions, dated July 5, 2024, and consisting of one-hundred thirty-seven (137) pages of various sizes and formatting.

3. The "84 Frederick Street Electrical, Mechanical, And Plumbing Report" as prepared for the Region of Waterloo by Smith and Long Limited, and consisting of seventy-four (74) legal sized pages.

The Contractor is cautioned that this report is provided for reference purposes only. The Mechanical and Electrical Work requirements for this Contract are as outlined in the Contract Documents and not this report.

**4. ADDENDA**

1. Addenda may be issued by the Owner prior to the submission of proposals. Include all Work described by Addenda in the proposed contract amount, contract time, and contract schedule,

**END OF SECTION**

## 1. GENERAL

### 1. Related Sections

1. Contractor is to thoroughly review all sections and divisions of the Specification, and the Contract, Drawings and Schedules, to ensure that work of this section is understood together with all related items of the Contract.
2. Particular attention is drawn to the following:
  1. Form of Agreement, General Conditions as modified by the Supplementary Conditions
  2. All sections of Division 01
  3. Existing Conditions and Reference Documents
  4. List of Documents Section 008000

### 2. Description of Work

1. The Work of this Contract is for renovation and renewal of existing building components and systems, to both the interior and exterior of the existing Group C shelter building located at 84 Frederick Street in downtown Kitchener.. The Region of Waterloo is depending upon the performance and completion of the Work of this Contract in accordance with its requirements and strict achievement of the particular schedule milestones that are set out in Section 013020 Construction Schedules.
2. Portions of the property and the existing facility will remain in use and occupancy throughout the duration of the Contract Time for the Work. Accommodate users' requirements for use and enjoyment of these areas throughout the Contract Time, without further cost to the Owner or increase in Contract Time.
3. The Work includes installed Products and materials shown on the drawings and described in the Specifications, Building Systems performance requirements, and related construction and services, all as described in the Contract Documents. Provide for all setting out, co-ordination, administration, liaison with authorities, construction, commissioning, and include measures for the safety and protection of the Work, the work force, and the public. Provide final cleaning to all areas affected by the Work, including temporary use and areas affected by the Work. Provide all other requested items of work, and all items reasonably inferable as necessary for the construction, all Construction Equipment, to the performance standards set out in the Contract.
4. The Contractor shall obtain clarification of requirements from the Consultant, in all cases of uncertainty, prior to proceeding with aspects of the Work affected by the uncertainty.
5. The Contractor shall employ Subcontractors (referenced throughout the documents as Subcontractors or Trade Contractors), Suppliers, tradespersons, and labour that have clearly demonstrated experience in achieving the requirements that form an integral part of the Work. This includes the ability to integrate work and services to achieve design intent using further design and services as necessary to continue the design and create the performance required, through the construction phase of the project. Further and special requirements for expertise in construction and detailing are outlined in Section 011020 Special Project Requirements, Division 01 of the Specification, and in particular sections of further Divisions of the Specification.
6. The design that forms the basis for the *Work* involves the integration of new aspects of the construction in to existing systems addressing aspects of performance required in the completed *Facility*. These systems are referred to throughout the documents as *Building Systems*. These Systems are identified in the Contract Documents, and more particularly in Division 01 of the specification. Note that *Building Systems* is a defined term in this Contract, and includes exterior and site systems where applicable. See Section 019010 for further clarification regarding required work and standards for all *Building Systems*. The Contractor shall examine requirements, organise the planning, and direct the performance of the *Work* so as to achieve the prescriptive and performance standards for each *Building System* identified in the *Contract Documents*.

3. Schedule

1. The Owner requires, and it shall be an integral part of the Contract, that work is performed in a timely and efficient manner, without delay, and with proper planning and co-ordination of the phases of the Work. The Contract is to be substantially performed and shall be Ready for Use on or prior to the dates identified in the completed bid forms and elsewhere in Division 01 of this specification. Aspects of the Work are required for completion prior to Substantial Performance of the Work, in order to ensure that the contract schedule is achieved. These required progress milestones are as identified elsewhere in Division 01, in Section 013020. The Contractor is cautioned that *Ready for Use* and *Substantial Performance of the Work* are defined terms within the Contract that have specific requirements and meaning.
2. The Owner requires that the Work be undertaken in accordance with a Construction Schedule that clearly demonstrates the organisation of the Work for performance within the Contract Time. This design and document shall be submitted by the Contractor to the Owner for review and acceptance in accordance with the provisions of the Agreement and General Conditions as modified by the Supplementary Conditions and these specifications. The Construction Schedule shall be designed by the Contractor so as to ensure that interim milestones and the required dates for *Substantial Performance of the Work* and *Completion of the Contract* are met. Particular requirements for the Construction Schedule and means for the performance of the Work are described elsewhere in Division 01, in Existing Conditions Reference Documentation.
3. Notwithstanding the above, no Work shall be undertaken in rooms and spaces immediately adjacent the occupied Sleeping Room (room no.M07) between the hours of 10:00PM and 8:00AM local time, excepting only upon written permission from the Owner.

4. Documents Required

1. Maintain at job site, one copy each of following:
  1. Complete Contract Documents;
  2. Complete Permit Documents as issued by Authorities;
  3. All Construction Forms issued by the Consultant, including but not limited to Field Reviews, Supplemental Instructions, Notices of Proposed Change, Change Orders and Change Directives;
  4. All documents relating to any modifications to the Contract;
  5. Reviewed and accepted Submittals;
  6. Reviewed and accepted Construction Schedule, updated regularly to show performance of the Work in accordance with the requirements for Contract Time;
  7. Manufacturers' installation and application instructions for all Products and materials;
  8. Reference Standards listed in Division 01 of the Specifications, and Part 1 of Specification Sections under Reference Standards, and throughout the Documents, to which the work is to conform; and
  9. Copies of all applicable regulations and legislation in force at the Place of the Work.
  10. Copies of all inspection reports of Authorities Having Jurisdiction; and
  11. Contractor's red-line as-built drawings, updated regularly as the work progresses.

5. Existing Conditions

1. Existing conditions are as described in Section 002000 of the bidding information and the associated Reference Documents for the Contract. Notify Consultant and Owner immediately of conditions at variance with information reasonably inferable from Reference Documents, the Contract Documents, and the Contractor's initial and ongoing inspections of the Place of the Work. The Contractor's inspection of conditions prior to and during the performance of the Work shall be undertaken in accordance with the performance standards for examination and inspection as set out in the Supplementary Conditions and General Conditions, and this specification.
2. The Contractor shall incorporate existing conditions into its design for the ways and means of performing the Work, and include all costs related to such performance in accordance with the

existing conditions as described, as discerned by the Contractor from its inspection of documents and existing conditions, to meet Contract Time, interim milestones, and schedule requirements without compromise to quality requirements for the completed Work and Facility.

6. Existing Services

1. Where Work involves breaking into or connecting to existing services, carry out work at times directed by governing authorities and acceptable to Owner, with minimum of disturbance to Owner, the existing property and facility, and the public.
2. Before commencing work that may in any way affect existing services whether known or unknown, establish location and extent of service lines in area of the work and notify Consultant of findings. Arrange and pay all costs for such locates by a private locates firm using qualified personnel with experience and expertise in such work and with appropriate insurance against error, failure to perform, omission or negligence in the performance of its services. Note that public utilities will only locate services on public lands or for publicly owned services. The Place of the Work for this Contract involves a number of privately owned services whose location is only approximately known. Any existing conditions information provided by the Owner must be examined and verified by the Contractor using its own forces and appropriate resources, to the standard of care and diligence required by the Contract. Neither the Owner nor Consultant warrant the accuracy of existing information or reference information made available to the Contractor.
3. Submit schedule to, and obtain approval from, authorities having jurisdiction and acceptance by Owner for any shut-down or closure of active service or aspect of the operating and functioning Facility. Adhere to accepted schedule and provide notice to affected parties. Perform this work, if required by the Owner, on off-hours or holidays at no additional cost to the Owner. This includes, but is not limited to, additional inspection costs from authorities for special inspection scheduling during non-working hours.
4. Where unknown services are encountered, immediately advise Owner and Consultant and confirm findings in writing.
5. Remove abandoned services. Cap or otherwise seal lines at cut-off points as directed by Consultant.
6. Record locations of maintained, re-routed and abandoned service lines, in accordance with identified standards for record documentation in Division 01 of the Specification.

7. Additional Drawings and Supplemental Instructions

1. The Consultant may furnish additional drawings and site instructions to clarify the intent of the Work. These items shall be consistent with the Contract requirements, and have the same meaning and intent as if they are included within the Contract Documents. Perform work in accordance with such additional information at no cost to Owner and without change to the Contract Time.

8. Imperial Project

1. This project is documented in the Imperial System. Where measurements are expressed in imperial units, such measurements may be either hard or soft converted units. Where both metric and imperial sizes or dimensions are shown, the imperial size or dimension shall govern. Notwithstanding, all units specified shall be taken to be the minimum unless otherwise noted.
2. All units specified shall be taken to be the minimum acceptable unless otherwise noted.
3. It is the Contractor's responsibility to check and verify with Subcontractors, Suppliers, and in turn Subcontractors' manufacturers and Suppliers on the availability of materials and Products in either metric or imperial sizes.

4. Where a material or product cannot be obtained in the size specified, provide the next smaller metric or imperial size available. Adjust all work upon which the product depends without change in Contract Price or Contract Time.
9. Relics and Antiquities
    1. Relics and antiquities and items of historical or scientific interest such as cornerstones and contents, commemorative plaques, inscribed tablets, and similar objects found at the Place of the Work or in buildings to be renovated, shall remain property of Owner. Protect such articles and request directives from Consultant.
    2. Give immediate notice to Consultant when such finds are encountered during construction, and await the Consultant's written instructions before proceeding with work that affects such finds and/or the area affected by the find.
10. Clarifications to Definitions and Additional Definitions
    1. Throughout Division 1 there are defined terms. Note that where a term is defined wherever in the *Contract Documents* it shall apply throughout the *Contract Documents*. The Contractor shall inspect the definition of terms as set out in CCDC2-2020 as modified by the Owner's Supplementary Conditions, and shall further note the following:
      1. *Provide* means to *supply* and *install*. The term *provide* shall be read to mean in all cases "*provide* by the Contractor as part of the *Work*" unless the context specifically states that the Owner or Consultant or authority having jurisdiction shall *provide* the item referenced.
      2. *By Others*, when used in the *Contract Documents*, shall not mean by someone other than the Contractor. The item shown is required by the *Contract*, but may be provided by another design or Trade Contractor, or *Supplier*. The only means by which something shown or specified is indicated as not being required by the *Contract* is by the use of the initials "N.I.C." or the words "not in (the) *Contract*" or "by Owner".
      3. *Exposed* means visible by the occupants at Completion of the Contract, unless indicated otherwise. This includes but is not limited to roof areas, mechanical and service spaces, inside of cupboards and surfaces visible from any point in the occupied finished *Work* such as door tops and bottoms, shelf and bulkhead tops, and interior portions of ductwork through grilles and diffusers.
      4. *Facility* means the improvements and their commissioned functional operation that are to be constructed and/or altered by the Contractor as the outcome of the Project and pursuant to the *Contract*. Facility includes but is not limited to both existing and new portions of the property and building or buildings that are affected by the *Work*.
      5. Where the words "*Reviewed*", "*Instructed*", "*Accepted*", "*Required*", "*Directed*", "*Permitted*", "*Inspected*", "*Ordered*" or similar words are used it shall be understood that they mean, unless the context provides otherwise, "*reviewed* by the *Consultant*", "*instructed* by the *Consultant*", "*accepted* by the *Consultant*", "*required* by the *Consultant*", "*directed* by the *Consultant*", "*permitted* by the *Consultant*", "*inspected* by the *Consultant*", and "*ordered* by the *Consultant*".
      6. Where the words "*satisfactory*", "*submit*", or similar words or phrases are used in the *Contract Documents*, it shall be understood that they mean, unless the context provides otherwise, "*satisfactory* to the *Consultant*" and "*submit* to the *Consultant*".

**END OF SECTION**

## **1. GENERAL**

### **1. Related Sections**

1. Contractor is to thoroughly review all sections and divisions of the specification, and the drawings, to ensure that work of this section is understood together with all related items of the Contract.
2. Particular attention is drawn to the following:
  1. Form of Agreement and General Conditions as modified by the Supplementary Conditions
  2. All sections of Division 01
  3. Existing Conditions
  4. Designated Substances and Hazardous Building Materials Assessment
  5. Construction Sequencing.

### **2. Special Project Conditions Regarding Definitions and Reference Standards in This Contract**

1. Throughout the specification, performance standards and/or terms may be defined for the explicit purpose of this Contract and its requirements. Similarly, reference may be made to particular expertise or knowledge that the Contractor shall provide either directly or through Subcontract with Trade Contractors, for the means and methods by which such performance standard is to be met or the Products supplied and installed. This may include reference to specific existing situations in the locality of the community or work, or to industry-specific examples, that are identified as meeting the required standard. The Contractor is specifically cautioned that the Work, such standards, and such terms include these special project conditions. No industry practice, norm, or Contractor or Trade Contractor practice shall affect the requirement that the Work be undertaken to meet or exceed such standards, performance requirements, or terms.
3. Special Project Procedures required by the Owner are also identified and referenced in Section 002000, for additional work standards established by the Owner, for work standards recommended in reference documents and reports, and elsewhere in the Documents. Comply with these requirements in the performance of the Work at no additional cost.

## **2. DESIGN & PROVISION OF WORK REQUIRED TO SEQUENCE CONSTRUCTION**

1. As described on drawings and elsewhere in the specification, the Work must be performed with scheduling that will not conflict with the Owner's use and enjoyment of the portions of the property or facility not under the Contractor's direct control. This includes accommodation of Owner's and its tenants special events.
2. Trade Contractors and Subcontractors and Suppliers are bound by this condition, and shall submit upon request such information and subcontract paperwork as reasonably required by the Consultant so that the Consultant can determine that portions of the Work are organised to comply with requirements for sequencing and scheduling of multiple mobilizations as set out in the Contract. For further clarity, the organization of the performance of the Work includes all multiple mobilizations necessary to perform the overall Work in the most expeditious manner and with least disruption to the Owner's use and enjoyment of the existing property and facility, all without additional cost to the Contract or effect on the Contract Time.

## **3. REQUIREMENTS FOR CONTINUOUS ACCESS AND CIRCULATION**

1. The sequence of construction and organization of the Work must at all times defer to and incorporate the requirements for continuous access to adjacent properties and portions of the existing facility. The contractor shall provide temporary routes, shall schedule shutdowns and interruptions, and shall design the ways and means for accomplishing the Work to ensure continuous use and access through these areas.

2. The Contractor shall fully incorporate in its design of the ways and means for performance and accomplishment of the Work: the requirements of the Construction Sequencing as set out in drawings and specifications, the Existing Conditions Section 002000, and the Owner's Operations, Safety, and Security Conditions.. Incorporate all such conditions at no further cost to the Owner or adjustment in Contract Time.

#### **4. SITE SAFETY, HOARDING & SECURITY**

1. The hoarding requirements for this Contract include the construction of site enclosures to effectively separate public areas from construction areas. Such areas shall be enclosed of material suitable in accordance with referenced standards and applicable legislation, and secured to prevent unauthorised entry. Ensure security of both the area of the Work and the remainder of the existing facility against vandalism so that the security of the facility is not compromised. Provide all hoarding and security for the duration of the Project and pay all costs for this protective hoarding. Submit site safety, hoarding and security plan to Authorities and Owner for approval prior to construction start.

#### **5. SPECIAL PRODUCT AND SYSTEM COMMISSIONING REQUIREMENTS**

1. It is a requirement of the work of this Contract that all products and materials likely to off-gas as a result of their newness of manufacture, be supplied and installed so as to minimise the off-gassing. Provide temporary ventilation and /or protection to existing systems and occupied areas (including areas to be occupied during construction off-hours, so that cross-contamination with existing and operational portions of the facility is avoided and areas returned temporarily to the Owner's control and use are free of contaminants.
2. Products, materials, and processes that may require such special provisions include but are not limited to welding, painting, adhering and sealant work, roofing, spray applied materials and products, processes that generate dust, and work that may compromise the integrity of water supplies, environment, means of egress or exiting, or safety.
3. Provide all protection to the areas adjacent the work, and the public, from generation of noise, dust, arc of welding, and all other processes of installation and commissioning that may pose a hazard to the public from any publicly accessible area adjacent the Work.
4. Requirements for commissioning of Work and systems are further described elsewhere in the specification, to ensure indoor air quality at time of handover, following building flush out that is further specified in this Division.

#### **6. REQUIREMENTS FOR BEHAVIOUR, DECORUM AND WORKPLACE CULTURE**

1. Requirements for personal clothing and dress begin with workplace safety legislation, which requires personal protective gear and clothing as appropriate for the workplace. Long pants, shirts with sleeves, clothing that protects workers on electrical systems from arc flash and similar requirements shall be followed by all personnel at the Place of the Work. In addition, clothing shall be worn that communicates to all others at the Place of the Work and to the public a professional standard of conduct and respect for the dignity of self and others, regardless of age or gender. The Contractor shall enforce these standards and requirements throughout the Place of the Work.
2. Requirements for behaviour, decorum and workplace culture begin with strict adherence to applicable laws, regulations, codes and standards that govern our society and the workplace. The Contractor, all Subcontractors and Suppliers, the Consultant, the Owner, and all members of their respective workforce shall perform work and conduct themselves in relation to each other and the public in a courteous and professional manner that communicates respect for the dignity of self, for one another, and respect for the following Core Values:

the rule of law, honesty, integrity, dignity of the person, leading by example, respect for diversity, and the promotion and maintenance of a workplace free of abuse, discrimination and harassment.

3. The Contractor shall establish and maintain an open, transparent, and well-communicated set of procedures for the deliberate promotion and maintenance of a workplace that upholds and provides leadership for the construction industry with respect to behaviour, decorum, and positive workplace culture. The procedures shall communicate and enforce the Core Values that govern relations within the work force, among the firms and entities involved in the Project, and in relations with the public. This shall include a mechanism for binding all Subcontractors and their employees and representatives to this standard and requiring enforcement of this standard at all levels of the construction contract chain. This shall include a mechanism for reporting, investigating, and resolving any complaint regarding failure to achieve these standards or the required workplace culture, without negative consequence for any complainant.
4. There shall be no posting or display of images or language (whether in job trailers, within job boxes, vehicles, on clothing, or anywhere else at the Place of the Work) that may be reasonably be construed by others as failing to uphold the Core Values that form the standard for the required workplace culture.
5. There shall be no broadcast of music, sound, speech, action, gesture, taking or dissemination of photos or images, or other similar display or sharing through personal devices or otherwise of material that may be reasonably construed by others as failing to uphold the Core Values that form the standard for the required workplace culture.
6. Any findings of the Consultant with respect to the requirements shall be considered final and shall be acted upon immediately by the Contractor, Consultant, or Owner as the case may be. Such findings and actions shall be without prejudice to any other right or responsibility that a worker or firm may have with respect to applicable law regarding such matters.

## **7. HAZARDOUS MATERIAL ABATEMENT AND TREATMENT**

1. The Contractor and all Subcontractors and Suppliers that are engaged in the provision of portions of the Work for installation of the Work are specifically cautioned that all ways and means necessary for the abatement of hazardous materials, designated substances, and treatment of potentially harmful elements, as set out herein and elsewhere in the specification and reference documents, forms a special requirement of the Work in response to the existing conditions. Pay all costs and be responsible for this work wherever the Contract Documents or Reference Documents identify such substances either in existing conditions or new work.
2. All trade contractors shall design procedures, implement protection for workers, and perform material removal and salvage in accordance with a design approved by authorities having jurisdiction, at no further cost to the Owner. Special requirements for working conditions in the presence of designated materials and hazards, and the requirements for abatement in re-used material, and the requirements for disposal of such material where not identified for re-use in the finished Work, are further set out in the OHSA, by the Ministry of Labour requirements and guidelines, in other applicable Federal and Provincial legislation, and elsewhere in this specification.
3. The Owner is not aware of hazardous materials or designated substances at the Place of the Work, other than as contained in Reference Documentation.
4. Wherever the Contractor, any Trade Contractor, or any worker uncovers or believes to have uncovered the potential for presence of Hazardous Material or Designated Substances in the Work, the aspect of the Work being performed shall immediately be stopped and the area protected. The Contractor shall be informed and shall seek instruction and clarification from the Owner and Consultant regarding the presence, or possible presence, of the substance or material.

## **8. EXISTING BUILDING SERVICES CONSTRUCTION REQUIREMENTS**

1. The Contractor shall perform the Work with due regard for the risks associated with construction activities as they may impact transmission of noise, dust or other contaminants throughout the Place of the Work, to or from or throughout existing or new Building Systems, and to surrounding facilities and the public way.
2. All building systems shall be protected from infiltration of any kind that results from the construction process. Schedule the installation of new below grade work, piping, new HVAC, and similar so that open excavations, pipe, ductwork, conduit or other aspects of a Building System is minimized. Seal all supplies and returns from such systems where they open into areas under construction, and provide bypass to ensure that performance of the existing system and its components is not compromised.

## **9. BUILDING PERMIT AND REGULATORY INSPECTIONS**

1. The Owner will apply and pay for the Building Permit required under the Ontario Building Code. Contractor is advised that workload at the authorities having jurisdiction may delay permit issuance.
2. Application and payment for all damage deposits, and other permits, licenses, fees and costs remain the responsibility of the Contractor. For clarification, the Contractor is required to post all damage deposits required by the authorities having jurisdiction as a condition of permit issuance.
3. Obtain copy of Building Permit from Owner, complete with drawings on which authorities having jurisdiction may have made comments, and examine same. Advise Consultant of any changes required, complete with associated costs
4. Arrange all required inspections by authorities having jurisdiction on behalf of the Owner.
5. The Contractor applies for, pays for, and obtains all other required permits for the Work.

## **10. PRE-CONSTRUCTION SURVEY**

1. Prior to commencing work, complete a survey of existing conditions within work area(s) and along path of travel for goods to be delivered and removed from the site. This survey includes all areas of adjacent properties and the public way for a minimum of 3 metres from the Site and further as reasonably required to ensure that existing conditions of adjacent lands, adjacent areas of the property, and the public way are known and recorded in detail.
2. Owner will accompany Contractor on inventory tour. Arrange mutually agreeable time for survey. Perform a second survey during evening hours, and verify the function of all lighting that is controlled by photocell or other items only functional during evening hours. Record condition of all light fixtures, interior and exterior. Failure to catalogue non-functioning fixtures means that all fixtures and lamps were functional prior to start of construction.
3. Inventory all existing damage, accurately recording all observed conditions. Use photographs, written records, spreadsheets videography, etc. to fully document existing conditions, noting existing damage in sufficient detail to act as record of conditions.
4. Within 2 business days of inventory, and prior to commencing demolition or construction, provide each of Owner and Consultant with copy of inventory records. Identify photographs using numbers and detailed descriptions of observed damage.
5. Owner will review submission. Revise and resubmit rejected inventory. Demolition and/or construction may only commence after acceptance by Owner of inventory records.

6. Repair and make good any damage found subsequent to submission of inventory, which in the opinion of the Consultant is the result of the Work, and which is not documented in the inventory submitted to the Owner and Consultant to Owner. Repairs shall return damaged elements to their condition prior to start of work. Where work increases extent of existing damage, repair shall return element to match previous damaged condition. Refer to CCDC 2 – 2020, GC 9.1
7. Where repairs cannot, in the opinion of the Consultant, be expediently implemented the Consultant shall ascertain the value to be deducted from the amounts due the Contractor.

## **11. OTHER CONTRACTS: LEGISLATIVE COMPLIANCE**

1. Be advised that the Owner may let other contracts for other works on this property or within the existing facility, and the work of this Contract shall be organised by the Contractor in all cases to prevent the Owner becoming the constructor for any project, as defined in applicable Occupational Health and Safety legislation.

## **12. SUSPENSION REQUIREMENTS FOR SUSPENDED CEILINGS, MECHANICAL AND ELECTRICAL ELEMENTS, REQUIREMENTS FOR SEISMIC**

1. Suspended acoustic tile ceilings, and suspended mechanical and electrical items shall be suspended from and anchored to structural loadbearing members. Where hangers and supports provided with Product are of inadequate length, size or strength, provide new suspension systems. The term *loadbearing* shall be as defined in the Ontario Building Code.
2. For greater clarity, and in addition to other site conditions that affect support systems, note that this facility is being constructed to the requirements of normal importance in the OBC.

Notwithstanding, all suspended elements such as ceilings, and electrical and mechanical systems components must be secured and supported to withstand earthquake loads and other loads that may be reasonably anticipated from earthquake and other natural occurrences that are outlined in the Ontario Building Code.

**END OF SECTION**

## 1. GENERAL

### 1. Related Sections

1. Contractor is to thoroughly review all sections and divisions of the specification, and the drawings, to ensure that work of this section is understood together with all related items of the Contract.
2. Particular attention is drawn to the following:
  1. Form of Agreement and General Conditions as modified by the Supplementary Conditions
  2. All sections of Division 01
  3. Existing Conditions
  4. Designated Substances and Hazardous Building Materials Assessment
  5. Construction Sequencing Drawing Sheet A004
  6. List of Documents Section 008000

### 2. Occupancy of Existing Buildings and Site

1. The existing ground floor North wing of the facility will be occupied by the Owner through the course of the Contract Time, and the Work shall be organized to ensure that the Owner has access to and use of spaces that are adjacent to the areas under the Contractor's control, including for shelter entry, emergency entry and egress, and deliveries to and from the building. Exceptions to this requirement involve scheduled and strictly observed shutdown periods only, as proposed by the Contractor and accepted by the Owner.
2. All services shutdowns must take into account the Owner's existing operation and requirements for shelter services and facility operational continuity. Obtain Owner's acceptance of all proposed interruptions and minimize interruptions.
3. Maintain level of fire protection in existing building at all times, including existing fire separations and all existing protection measures which are to remain or to be exceeded in the finished Work. Maintain equivalent fire protection to adjacent buildings and areas as will be present in the finished work where at all possible, and notify Owner of temporary duration and timing of increased fire exposures resulting from the performance of the Work.

### 3. Removal of Existing Work and Salvage

1. Remove elements, components, materials, and equipment as required by the Work. Relocate same as indicated on Drawings or as necessary to accommodate the intent of the Work, regardless of whether the relocated item is to receive changes or further work under this Contract. Pay all cost for this work.
2. Store and protect relocated items from damage until built into new locations.
3. Limit removals to smallest areas possible, and make good disturbed items.
4. Salvageable items may only be used in new work where suitable and approved by the Owner by direct instruction in the Contract Documents or an approved Change Order amending the Contract Price and Time. Otherwise provide all new products.
5. Materials recovered from work and which are not indicated in drawings or documents to be relocated or required by the Owner shall be offered at no charge to the Owner. If accepted by the Owner, the Contractor shall deliver the material to a storage place of the Owner's choosing on the property. Materials and products declined by the Owner become the property of the Contractor and shall be disposed of away from site and property in a manner consistent with the requirements of authorities for such materials. Pay all costs for this work, including any costs resulting from classification of such materials as hazardous, and for the disposal of designated substances, where the nature of such classifications can be reasonably assumed.

6. Remove debris and accumulated waste from the demolition areas immediately. Ensure that during removal operations the existing elements for re-use and new work are not damaged and dirt, debris and dust are not spread beyond the work area. Repair all damage promptly and pay all costs for such repairs.
  7. Comply with requirements for interferences, cutting & patching, as specified in Section 013050.
4. New and Replacement Work
    1. Make good materials, and prepare surfaces and refinish all finished surfaces damaged, marred, replaced, or otherwise remedy damage to materials and elements identified for salvage, relocation, re-furbishment or re-use in the newly constructed work. Pay all costs for this work.
    2. Finish new surfaces flush with existing surfaces at edges of the areas affected by the Work. Blend junctions between existing and new such that upon completion and growth of vegetation they shall be visually undetectable.
  5. Contractor's Use of Property
    1. Limit access of construction personnel to the Place of the Work to locations and times strictly necessary for performance of the Work and in accordance with the required sequencing, the accepted Construction Schedule, and the Contract Documents.
    2. Prohibit lounging and smoking on the property.
    3. Keep areas clean under work of contract, and return them to an "as new" condition at completion of construction. Replace, or make good as approved by the Owner, damage to Facility, property, fixtures and fittings caused howsoever. Include cost of installation and making good of other work thereby affected in replacement.
  6. Existing Services
    1. Ensure that existing services are not damaged during construction operations, wherever performed.
    2. Should existing services be accidentally uncovered and disrupted, make complete restoration immediately, and ensure adequate protection to avoid further disruption until alternative means of providing permanent continuation of the services are made.
    3. Make payment for work specified in the foregoing at no additional cost to the Owner if, in the opinion of the Consultant, such work could have been reasonably foreseen by examination at time of tendering through careful inspection of existing conditions and reference documentation, and for damage that has been caused by lack of proper care and protection in the performance of the Work.
    4. Unless otherwise specified, restore services on which work is performed to original condition.
    5. This Contract requires that the Contractor cooperate and work with the Owner and other organizations, including telecommunication and data providers, and similar, to arrange for the extension or alteration of existing systems where indicated in the Contract.
    6. Provide modifications or make connections to existing services that require shut-down of main building services only upon written approval of Owner.

**END OF SECTION**

## 1. GENERAL

### 1. Related Sections

1. Contractor is to thoroughly review all sections and divisions of the specification, and the drawings, to ensure that work of this section is understood together with all related items of the Contract.

### 2. Usage of Abbreviations

1. Many words or expressions that are repeated frequently on the drawings or in other portions of the documentation are abbreviated to reduce the amount of wording that might obscure the detailing. To avoid misinterpretation, these abbreviations are listed, with their full meaning in this Section.
2. In addition to those noted, some other abbreviations, commonly used in Specifications, are separately listed in Section 014020 Reference Standards and Codes. Refer also to Mechanical and Electrical Drawings and Specifications for other abbreviations used in Mechanical and Electrical Documents.

### 3. List of Abbreviations:

A or Amp	ampere		bottom of curb
AB	air barrier or anchor bolt	BOT	bottom
ABV	above	BSMT	basement
A/C	air conditioning	BU	built-up
ACOUST	acoustic	BUL	bottom upper layer
ACT	lay-in acoustic tile	BUR	built-up roofing
AD	area drain	BTU	British Thermal Unit
ADO	auto door operator	BTUH	BTI per hour
adj.	adjustment	C	centre or channel section
AFF	above finished floor	C°	degrees Celsius
AGG	aggregate	CAB	cabinet
ALUM	aluminium	CAL	Caliper
ANOD	anodized	CANT	cantilever
AP	acoustic panel	CB	catch basin or concrete block
approx.	approximate	CBMH	catch basin manhole
AR	abuse resistant	C/C	centre to centre
ASPH	asphalt	CCG	ceramic coated glass
AVB	air/vapour barrier	CEM	cement
@	at	CFFD	combination funnel
B	bottom		floor drain
BC	black chrome	CG	corner guard
BBD	blackboard	CI	cast iron
BD	board or bollard	CJ	control joint
BDD	bollard, decorative	C.L.	centre line
BE	baked enamel	CL	close or closer
BF	barrier free		classroom function
BKHD	bulkhead	CLASS	ceiling
BLDG	building	CLG	clear
BLK	block	CLR	closet
BLKG	blocking	CLOS	centimetre
BLL	bottom lower layer	cm	concrete masonry unit
BM	bench mark or beam	CMU	clean-out or
BO	bottom of	CO	
BOC	bottom of concrete or		

Abbreviations

	carbon monoxide	EXIST	existing
COL	column	EXH	exhaust
CONC	concrete	EX JT	expansion joint
COND	conduit	EXT	exterior
CONN	connect or connection	EXP	exposed
Contr.	Contractor		
CONST	construction	F	floor
CONT	continued	FA	fire alarm, or from above
CONV	convection		
CPT	carpet	FATB	from above to below
CPT.T.	carpet tile	FBTA	from below to above
CRC	cold rolled channel	FD	floor drain or fire damper
CRS	courses		
CSK	countersunk	FDN	foundation
CT	ceramic tile	FE	fire extinguisher
CTB	ceramic tile base	FEC	foodservice equipment contractor, or fire extinguisher cabinet
CTE	connect to existing		
c/w	complete with	FF	force flow heater
CW	cold water	FFD	funnel floor drain
CWP	crystalline waterproofing	FF&E	furniture fixturing & equipment
CYL	cylinder		
		FH	fire hydrant
DB	dead bolt	FHC	fire hose cabinet
DCB	double catch basin	FIN	finish or finished
DET	detail	FL	floor
DIA	diameter	FLA	full load amp
DIAG	diagonal	FP	flag pole
DICB	ditch inlet catch basin	FPRG	fireproofing
DIM	dimension	FRR or f.r.r.	fire resistance rating
DIV	division	FS or f.s.	fire separation
DL	dead lock	ft.	foot
DO	ditto or door operator	FTG	footing
		FUT	future
DN	down	FLA	full load amp
DP	deep		
DR	drain	GA	gauge
DS	door stop	gal.	gallon
DUC	door undercut	GALV	galvanised
DWC	digital wall covering	GB	grab bar
DWG	drawing	GBD	gypsum wallboard
DWLS	dowels	GFI	ground fault interrupted
		GI	galvanised iron
EF	each face, exhaust fan	GL	glass
EGFI	exterior ground fault interrupted outlet	g.l.	gridline
		GR	grade
EJ	expansion joint	GRAN	granular
EL	elevation	GRD	ground
ELEC	electrical	GV	gas valve
ELEV	elevator	GWA	guy wire anchor
EMERG	emergency	GWB	gypsum wallboard
ENCL	enclosure	GWG	Georgian wired glass
EP	electrical panel		
EQ	equal		
EQUIP	equipment	H or HORIZ	horizontal
ER	existing to be relocated	HB	hose bib
EW	each way	HCWD	hollow core wood
EWC	electric water cooler	HD	hub drain or heavy-duty
EX	existing		

Abbreviations

HDWR	hardware	l/s	litres per second
H.E.F.	horizontal each face	L.W.	long way
HM	hollow metal	LWB	lightweight block
HM/INS	hollow metal/insulated		
H/O	hold open	m	metre
H.O.F.	horizontal outside face	M	metric
HP	hydro pole	MACH	machine
H.P.	horse power	MAX	maximum
HR	hour	MCC	motor control centre
HSS	hollow structural section	MD	motorised damper
		MECH	mechanical
HT	height	MET	metal
HTR	heater	MEMB	membrane
HVAC	heating ventilation and air conditioning	MEZZ	mezzanine
		MFGD	manufactured
HW	hot water or handwell	MFR	manufacturer
		MG	make good
HWD	hardwood	MGTME	make good to match existing
		MH	manhole
in.	inch	MHT	mounting height
IC	included in contract	MIN	minimum or minute
ID	inside dimension or inside diameter		
		MIR	mirror
INSUL	insulation	misc.	miscellaneous
INT	interior	MLWK	millwork
INV	invert	mm	millimetre
I/S	inside	MO	masonry opening
		MRT	marble tile
JAN	janitor	MT	mosaic tile
JB	junction box	MTD	mounted
j.c.	job check	MUA	make up air
JT	joint		
		N	no
KD	knockdown	N/A	not applicable
kg	kilogram	NFHB	non-freeze hose bib
KO	knockout	NFWH	non-freeze wall hydrant
kPa	kilopascal	N.I.C.	not in contract
kw	kilowatt	NO	number
		NOM	nominal
l	litre	NTS	not to scale
L	long or angle section		
LAM	laminated(d)	Ø	diameter
LAP	lay-in acoustic panel	OA	overall
LAS	latch set	OC	on centre
LAT	lateral	OD	outside dimension, or outside diameter
LAV	lavatory		
LB	light bollard	OEM	original equipment manufacturer
lb.	pound	OFF	office function
LD	light duty	OGL	obscure glass
LED	light emitting diode	O/H	overhead
LF	light fixture	OPNG	opening
LH	left hand	OPP	opposite
LHR	left hand reverse	OPSD	Ontario Provincial Standard Detail
LINO	linoleum		
LLV	long leg vertical	OPSS	Ontario Provincial Standard Specification
LOC	lock		
LP	lighting panel or light pole	O/S	outside
LS	light standard		

Abbreviations

OSB	oriented strand board	RUBB	rubber
OWSJ	open-web steel joist	RWL	rainwater leader
PA	public address	SAN	sanitary
PASS	passage function	SC	sawcut
PB	push button	SCWD	solid core wood
PC or PCC	precast concrete	SEAL	sealed concrete
PC	property corner	SECT	section
PCT	porcelain ceramic tile	SFPRG	sprayed fireproofing
PE	porcelain enamel	sim.	similar
PEP	porcelain enamel panel	S.L.C	sealed concrete
PERIM	perimeter	SND	sanitary napkin dispenser
PERF	perforate(d)	SNR	sanitary napkin receptacle
Ph	Phase	SP	static pressure
PL	plaster, plate or property line	SPD	Standard Proctor Density
P.LAM	plastic laminate	SPEC	specifications
PLY	plywood	SQ	square
PMP	pre-finished metal panel	SS	stainless steel or slop sink
PNL	panel	ST or STL	steel
POL	polish(ed)	STF	step down footing
POLY	polyethylene or polyvinyl chloride	STC	stormceptor
POR	porcelain ceramic tile	STD	standard
P/P	push/pull	STIRS.	stirrups
PR	pair	STM	storm
PRI	privacy function	STN	stain
PT	paint	STOR	storage function
PTL	push to lock function	STR	structural
PTN	partition	SUSP	suspended
PVC	poly vinyl chloride	SUW	set up and welded
QT	quarry tile	SV	sheet vinyl
R	resilient flooring, riser, or radius	S.W.	short way
RB	rubber base	SWB	switchboard
RBC	rubber base cove	SWM	stormwater management
R.C.	reinforced concrete	T	top or tread
RD	roof drain	T & B	top and bottom
RE	existing in relocated position	TBD	tackboard
REC	recessed	TDD	towel dispenser and disposal unit
RECP	receptacle	TEL	telephone
REIN	reinforced	TEMP	temperature
REL	relocated or relocate	TER	terrazzo
REQD	required	TERM	terminal
REV	revised, revision, or reversed	T & G	tongued and grooved
Ref or Refrig.	refrigerator	TG	tempered glass
RFL	resilient flooring	T.L.L.	top lower layer
RFG	rigid fibreglass (insul)	TME	to match existing
RH	roof hopper or right hand	T/O	top of
RHR	right hand reverse	T.O.C.	top of concrete or top of curb
RO	rough opening	T.O.S.	top of slab
RP	receptacle panel	TP	toilet partitions or telephone panel
RUB	rubber tile flooring	TRANS	transformer

Abbreviations

TRR	temperature rise rating	VOL	volume
T & S	temperature and shrinkage steel	VR	vapour retarder
TS	traffic sign	VWC	vinyl wall covering
TSTAT	thermostat	W	wall or wide flange section
T.U.L.	top upper layer	w/	with
TYP	typical	WBD	white board
U	up	WBLKG	wood blocking
UC	undercut	WC	washroom or water closet
U/F	unfinished	W.COL	wind column
UFD	underfloor cut	WD	wood
U.N.O.	unless noted otherwise	WG	wire guard
UP or U/P	unpainted	W.G.	water gauge
u/s	under-side	W/I	within
V	varnish, vertical or Volt	W/O	without
VB	vapour retarder	WP	waterproof
VBC	vinyl base cove	WPGF	waterproofing
VCT	vinyl composite tile	WS	wall stop
V.E.F.	vertical each face	WV	water valve
VEN	veneer	W.W.F.	welded wire fabric
VENT	ventilated, ventilator, or ventilation	Y	yes
VERT	vertical	yd.	yard
VEST	vestibule		
V.O.F.	vertical outside face		

**END OF SECTION**

## 1. GENERAL

### 1. Related Sections

1. Contractor is to thoroughly review all sections and divisions of the specification, and the drawings, to ensure that work of this section is understood together with all related items of the Contract.
2. Particular attention is drawn to the following:
  1. All Bid Forms and Supplementary Bid Forms
  2. Form of Agreement and General Conditions as modified by the Supplementary Conditions
  3. All sections of Division 01

### 2. General

1. All submissions under this section shall bear the project name, Owner's name and Project No., Consultant Project No., and date.
2. The breakdown of the Contract Price submitted by the Contractor at time of bidding and subsequent contract agreement shall form the basis for the schedule of values to which reference is made in GC 5.2 of the General Conditions, that identifies the value of all parts of the Work.
3. No progress payment may be claimed by the Contractor nor shall any payment be due the Contractor in the absence of a formal schedule of values that has been accepted by the Consultant and Owner. In the absence of such agreed and accepted breakdown of the Contract Price the Consultant may, at its discretion, impose a schedule of values in accordance with this Section, acting reasonably and without favour to either party in the Contract.
4. Contractor is solely responsible for ensuring that each of the Contractor's Subcontractors and Suppliers provides detailed information and such evidence as the Consultant may reasonably require or direct in order to arrive at an accepted schedule of values. This information may include, but not be limited to, copies of purchase orders and invoices for aspects of the Work. No "privity of contract" or similar claim shall be made by either Contractor or Supplier or Subcontractor as reason for not furnishing accurate information regarding the monetary value of any aspect of the Work.

### 3. Schedule of Values

1. Refer to CCDC 2 - 2020, GC 5.2 as modified by the Supplementary Conditions and as amplified and clarified by this Section.
2. Costs of temporary facilities and utilities shall be amortised over the duration of the Work. Claims for 'mobilization', 'bidding costs' or similar lump sums at or before start of work are not acceptable.
3. The items identified in the submitted Additional Bid Information which shall form the preliminary basis for the schedule of values, but shall further include or be modified for separate line items for the following parts of the Work:
  1. Record Documents and Manuals Work by the General Contractor
  2. Field Engineering and Layout by the General Contractor
  3. Final Cleaning – by a professional cleaning service
  4. Cost of Deliverables required by Division 01 of the specification but not specifically related to physical parts of the construction (for example, project meetings)
  5. Project Close-out documentation services by the General Contractor
  6. Value Added Tax

4. Within each item forming a line sum in the Schedule of Values for parts of the Work, the sum shall be deemed to include the following deliverables and shall have an independent and identified value for each:
  1. where the item involves Submittals, the cost of related services and Submittals (not to exceed 5% of the line item);
  2. all Markup associated with the part of the Work (including Contractor, all Subcontractor, and all Supplier Markup);
  3. cost of Product and material Supply (which shall be identified by major Product and material category as directed by the Consultant, including but not limited to off-site fabrication costs);
  4. cost of Installation, excepting only aspects of Installation identified in other line items in the Schedule of Values (which shall be identified by major installation category as directed by the Consultant, broken further into rough-in and finish stages where deemed applicable by the Consultant);
  5. cost of Commissioning, testing, balancing, verification and reporting of same, for the part of the Work; and
  6. performance of Project Close-out documentation associated with the part of the Work and required from all Subcontractors and/or Suppliers (not to be less than 3% of the value of the subtotal line item for the part of the Work).
5. The Contractor is hereby cautioned that all related services required by the Contact Documents for performance of the Work have monetary value that shall be identified in the Schedule of Values. No claim for payment shall be certified for related services not performed.

**END OF SECTION**

## 1. GENERAL

### 1. Related Sections

1. Contractor is to thoroughly review all sections and divisions of the specification, and the drawings, to ensure that work of this section is understood together with all related items of the Contract.
2. Particular attention is drawn to the following:
  1. Form of Agreement and General Conditions as modified by the Supplementary Conditions
  2. All sections of Division 01

### 2. General Requirements

1. The intent of this section is that all allowances shall be carried by the Contractor as a single total amount, and not by individual subcontractors. Contractor shall read entire specification prior to bidding and shall include in Stipulated Price Contract Sum, all allowances called for in this or any Section of Specifications or drawings. If allowances specified herein are repeated in other Sections, or if allowances are specified in other Sections but not listed in this Section, Contractor is requested to inform Consultant immediately during the bidding period in order that action may be commenced to implement the express intent that all allowances be carried by the Contractor.
2. Disbursements from allowances shall be authorized by the Consultant in writing.
3. The total amount of Cash Allowance shall be allocated to specific Cash Allowance work as authorized, or to Changes in the Work, at the sole discretion of the Owner.
4. Unexpended amounts of Cash Allowances shall be deducted from the Contract Price at certification for Completion of the Contract, in accordance with the General Conditions as amended by the Supplementary Conditions, except that for such deductions there shall be no allowance for Contractor's Markup as a deduction from the Change Order which processes the removal of unexpended amounts of cash allowances.
5. No refund of Mark-up will be expected from the Contractor if actual expenditure against the total is less than the total amount of Cash Allowances.
6. The maximum percentage Mark-up on any authorized overrun of aggregate total amount of the specified allowances shall be as set out in the General Conditions as modified by the Supplementary Conditions and Section 012040, as such Markups pertain to Changes in the Work.
7. Allowances include all taxes except HST, as calculated on net total only.
8. The Consultant may direct the contractor to obtain tenders, at no additional cost to the Owner, for work for which payment is made from allowances, and to enter into subcontract agreements for such work at such amounts as obtained by the tendering process. Choice of bidder and successful Subcontractor is at Owner's sole discretion.

### 3. Cash Allowances

1. Refer to GC 4.1, as amended by the Supplementary Conditions.
2. Include in the Contract Price, all Cash Allowances stated herein.
3. Cash allowances, unless otherwise specified, cover the net cost to the Contractor of services, products, installation, construction machinery and equipment, freight, handling, unloading, storage, and other expenses incurred in providing specified allowance work.

4. The Contract Price, and not the Cash Allowance, includes the Contractor's Mark-up in connection with such cash allowances. All Division 01 responsibilities and related service deliverables are included under Markup, by definition.
5. Progress payments on accounts of work authorized under Cash Allowances shall be included in the Contractor's monthly claim for payment, and Consultant's monthly certificate for payment.
6. A schedule shall be prepared by the Contractor to show when items called for under Cash Allowances must be authorized by the Owner for ordering purposes so that the progress of the Work will not be delayed. No claim for delay on this basis shall be valid if the Contractor has failed to comply with this requirement.
7. Cash Allowances are paid only on the basis of copies of invoices submitted to the Contractor that are due for payment within 32 days of the date of Contractor's monthly claim, and for Allowance items provided in a manner consistent with the Contractor's Construction Schedule for the provision of such items.
8. All Cash Allowances shall be carried in the Contract Price by the Contractor only, and not the subcontractors. All cash allowances are under the direct control of the Owner, and shall be expended in the interest of the Owner by Owner instruction. They shall be free of encumbrance, obligation, or agreement of any kind that may bundle or link Products or materials to be supplied under Cash Allowance to other aspects of the Work. The Contractor and all trade contractors shall disclose at time of bid close any attempt by any trade contractor or supplier to link cash allowance expenditures in the Work to any material, Product or service otherwise provided in the Work.
9. Include in the Stipulated Lump Sum Price a Total Cash Allowance of each following allowance for work specified in the respective specification divisions or sections, or on Drawings or Schedules. Note that Division 01 requirements that pertain to aspects of this work are not by Allowance, but are carried elsewhere in the Contract Amount by the Contractor.
  1. **The sum of \$5,000 CDN (excluding HST) for the cost of testing and inspection work by an independent materials and building systems testing firm or firms reporting to the Owner regarding Contractor's achievement of Contract requirements.**
  2. **The sum of \$30,000 CDN (excluding HST) for the Supply of Owner-selected Equipment, including but not necessarily limited to, washroom and shower accessories, laundry equipment and appliances, food service equipment. The cash allowance does NOT include work to install the equipment. Installation of these items is included in the Contract Price.**
  3. **The sum of \$25,000 CDN (excluding HST) for the Supply of Interior Building Signage by an Owner Nominated Signage Fabricator. The cash allowance does NOT include work to install the signage. Installation of signs is included in the Contract Price.**
  4. **The sum of \$500,000 CDN (excluding HST) for the supply and installation of new window units. The cash allowance excludes all Work to remove and dispose of existing windows, to provide temporary protection measures, and the provision of new interior sills. All such work is included in the Contract Price and not the allowance.**
  5. **The sum of \$50,000 CDN (excluding HST), for the provision of targeted replacements of existing millwork units in the 5 (five) apartment suites, as selected by the Owner. The cash allowance does not include for the provision of new millwork units where indicated on the Drawings. The provision of such units is included in the Contract Price. The Cash Allowance does not include the provision of new window sills. The provision of sills is included in the Contract Price.**
  6. **The sum of \$200,000 CDN (excluding HST), for an Owner's nominated Elevator Service Trade Contractor to provide all necessary upgrades to the Existing Passenger Elevator and Service Lift.**

- 7. The sum of \$40,000 CDN (excluding HST) for the Contractor's Performance Bonus, should the Contract interim schedule milestone for Occupancy of the Phase 1 Work be achieved.**
4. Contingency Allowance
  1. Refer to GC 4.2.
  2. Expend Contingency Allowance only on Consultant's written instructions.
  3. Do not include in the Stipulated Sum charges for Contractor's overhead and profit on expenditures from Contingency Allowance. Add such charges to the net cost of each expenditure from Contingency Allowance at the percentage rate established by the Documents for Changes in the Work, or agreed to by the Owner otherwise, all in accordance with the General Conditions of the Contract as amended by the Supplementary Conditions and the further clarification in Division 01.
  4. Include in each expenditure from the Contingency Allowance applicable taxes specified in the General Conditions of the Contract and the completed Bid Forms, excepting only the Value added tax (HST) which shall be separately applied.
  5. Credit trade discounts to the Owner, except do not credit cash discounts given to the Contractor for payments to accounts before net due dates.
  6. Deduct all expenditures from Contingency Allowance on succeeding applications for payment, as instructed in writing by the Consultant, until the Allowance is expended or before Contract Price is finally adjusted to remove unexpended portion from the Contract Amount.
  7. **Include in the Stipulated Lump Sum Price a Contingency Allowance of \$500,000 (excluding HST).**

**END OF SECTION**

## 1. GENERAL

### 1. Related Sections

1. Contractor shall thoroughly review all sections and divisions of the specification, and the drawings, to ensure that work of this section is understood together with all related items of the Contract.
2. Particular attention is drawn to the following:
  1. All Bid Forms and Supplementary Bid Forms
  2. Form of Agreement and General Conditions as modified by the Supplementary Conditions
  3. Specific provisions for Contract Amount breakdown in Section 012010 Schedule of Values.
  4. All sections of Division 01

### 2. General

1. All submissions under this section shall bear the project name, Owner's name and Project No., Consultant Project No., and date.
2. Where a Certificate of Clearance from the Workplace Safety and Insurance Board (WSIB) is requested, the Certificate submitted shall clearly show that the Contractor is in good standing with the WSIB.
3. WSIB "independent operator" status for any Contractor, Subcontractor, or Supplier is not acceptable.
4. Contractor is solely responsible for ensuring that each of the Contractor's personnel, including but not limited to employees, directors, officers, principals and executives of the Contractor, are covered by WSIB insurance.
5. Contractor warrants and certifies to the Owner that each of the Contractor's personnel, including but not limited to employees, directors, officers, principals and executives of the Contractor, are covered by WSIB insurance under specific and appropriate categories for the Contractor's operations as determined by WSIB.
6. Contractor shall defend, indemnify and hold harmless the Owner against any and all claims made due to failure to pay WSIB premiums or provide appropriate WSIB coverage for any person or firm engaged by the Contractor, directly or indirectly, for Work of this Contract.
7. Obtain a valid WSIB Certificate of Clearance from each Subcontractor or Supplier prior to releasing payment to the Subcontractor or Supplier. Indemnify and hold harmless the Owner against any failure of the Contractor to obtain valid Subcontractor's or Supplier's WSIB Certificate of Clearance prior to releasing payment to respective Subcontractor or Supplier.
8. All applications for payment after the first shall be accompanied by CCDC Statutory Declaration 9A, duly executed as a sworn statement under oath. CCDC Statutory Declaration 9A is acceptable only where it bears an original CCDC Statutory Declaration 9A copyright seal.

### 3. Invoicing Periods

1. Contractor shall submit monthly progress invoices. Invoices shall be dated last day of each month. Submit final invoice within 60 days of Completion of Contract as defined in applicable lien legislation and as modified by this Contract's provisions. Failure to submit invoices within schedule and in correct amounts and formats voids Owner's obligations to pay invoices in a timely manner.

4. Payments

1. Requirements for Schedule of Values and Pricing of Changes are described in Section 012010 and 012040 respectively. Conform strictly to such requirements and additionally note that General Conditions and Supplemental Conditions govern the claim for payment and payment processes.
2. The Contractor is cautioned that there are a number of instances and circumstances as described within the Contract Documents where failure to perform certain contract requirements prior to milestones or deadlines, and in case of certain circumstances or actions, neither the Consultant nor Owner are required to evaluate or process any claim for payment.

5. Applications for Payment and for Certificates

1. In addition to other requirements of the Contract, the following information applies to applications for payments, and applications under the Construction Act.
2. Progress Applications
  1. Progress applications for payment shall indicate the value complete of each item in the Schedule of Values, percentage complete to date of application, value previously certified for payment by the Consultant, and value of work remaining. All values shall be exclusive of Value Added Tax (GST or HST), except that Value Added Tax shall be applied to the total amount claimed, and the value of Value Added Tax indicated on the application.
  2. Include a summary of changes with application for payment, showing values complete.
  3. No payment will be made for Products ordered or manufactured, but not yet delivered to the Place of the Work.
  4. Include evidence to support claims for Products delivered to the Place of the Work, but not yet incorporated into the Work, as the Consultant may require to establish the value and delivery of the products.
  5. Products delivered to the Place of the Work are the property of the Owner and shall not be removed without the Owner's consent, except where rejected as defective products or removed as legitimate debris. All Products delivered and /or installed to the Place of the Work shall remain at the risk of the contractor notwithstanding that title has passed to the Owner.
  6. In addition to other requirements, progress applications shall indicate all required submittals due in accordance with the accepted Construction Schedule during any period prior to the date of claim but not yet performed.
  7. Applications for payment shall take note of progress on each line item and subdivision of the line items for the Schedule of Values as set out in Section 012010. No certification will be allowed for requirements of the Contract not performed.
  8. No applications for payment for progress shall be reviewed, nor any payment certified, for the period between the Contractor's application for Substantial Performance and Final Payment for Completion of Contract.
3. Applications for a Certificate of Substantial Performance
  1. Applications for a Certificate of Substantial Performance, release of holdback, and Statement of Completion shall be completed in accordance with OAA/OGCA Document 100 Takeover Procedures (latest edition) In Document 100, substitute "Consultant" for "Architect", and "review" for inspection where it appears in relation to the Consultant's assessment of the Work.

Payments

2. The Contractor shall make written application to the Consultant or the Payment Certifier for the certificate.
3. The application shall also include:
  1. statements that the contract is substantially performed as defined in the Contract, and including a calculation confirming that remaining contract amounts are not more than the percentages of amounts outlined in the Construction Act and meeting requirements of the Contract;
  2. a statement that all required submissions have been made;
  3. statements of completion with a cost value for deficiencies, outstanding documentation, work that can not be performed and which is beyond the Contractor's control, and any work which is to be completed at a later date as agreed to by the Owner;
  4. any set-offs agreed with Owner for value of work that shall be performed after Substantial Performance and that is proposed not for inclusion in the calculation of remaining work of the Contract;and
  5. a separate accounting showing the amount of holdback that shall be released from holdback provisions upon expiry of the period for liens, subject to Contract provisions for payments.
4. If the Consultant finds the application to be complete, the Consultant will visit the Place of the Work to verify the validity of the application.
5. If the application is accepted by the Consultant, the Consultant will issue a certificate of Substantial Performance to the Owner and to the Contractor.
4. Progress applications claiming monies against cash allowances shall be accompanied by true copies of all invoices and statements from suppliers or subcontractors furnishing products, etc., purchased under cash allowances.
5. A WSIB Certificate of Clearance, valid for the date on which payment of the progress claim is likely to be made, shall accompany all applications for payment.
6. All applications shall be accompanied by CCDC Statutory Declaration 9A, duly executed, with a copyright seal. CCDC Statutory Declaration 9A is acceptable only where it bears an original CCDC Statutory Declaration 9A copyright seal and in its most current form.
7. Provide originals of all documents for invoicing, except that WSIB material may be facsimile or electronic copy.
6. Release of Holdback
  1. Holdback monies will be released in accordance with Contract provisions and applicable legislation except that Owner may withhold sufficient funds to protect itself from loss on account or risk of any of the following:
    1. Defective work not remedied;
    2. Delay in performance of the Work that may be due to Contractor performance;
    3. Delay in submission of documentation;
    4. Claims filed or reasonable evidence indicating probable filing of claims;
    5. Overpayment for completed work or deficiencies having arisen;
    6. Damaged work or damage to Owner's property or facility caused by Contractor, its Subcontractors or its Suppliers.
  2. A Certificate for Payment of substantial performance holdback will only be made upon receipt by the Consultant of proof of publication of the Certificate of Substantial Performance from the publishing newspaper (Daily Commercial News) or equivalent accepted trade advertisement method meeting the requirements of legislation.

## Payments

3. Where the Contractor does not publish the Certificate of Substantial Performance within 10 calendar days of the Consultant's issuance of the Certificate, the Owner may, at the Owner's sole discretion, publish the Certificate of Substantial Performance, deducting the cost of the publication from the Contract Price. Cost of publication will include the advertising fees, plus Owner's and Consultant's labour costs charged at regular hourly rates for time involved in arranging publication. Where there are no regular hourly rates, costs shall be charged at hourly salary or wages multiplied by 3.

### 7. Final Payment

1. When all deficiencies have been corrected and the work completed, the Contractor may request that the Consultant visit the Place of the Work for a further review.
2. Upon being satisfied that all deficiencies have been corrected and that all other conditions listed under 1.6.1 above have been satisfied, all to the satisfaction of the Owner, the Consultant will so inform both the Contractor and the Owner.
3. Upon receipt of the Contractor's invoice, the Consultant will issue a certificate for final payment.
4. If a subsequent site review(s) is (are) required to verify 100% completion of deficiencies, the Contractor will be expected to compensate the Owner, by way of a change order to the Contract, for the time and travel expenses incurred by the Consultant for any subsequent review(s). The rates for time and travel are outlined in an agreement between the Consultant and the Owner.
5. If the deficiencies are not completed within a reasonable period of time, as agreed to by all parties, the Owner may invoke the requirements of CCDC 2-2020, GC 7.1 – Owners Right to Perform Work or Terminate the Contractor's Right to Continue with the Work or Terminate the Contract.

### 8. Tax Recovery

1. When an exemption or recovery of government sales taxes, duties or excise taxes is applicable to the Contract, the Contractor shall at the request of the Owner assist, join in, or make application for an exemption, recovery or refund of all such taxes and duties. All amounts recovered or exemptions obtained shall be for the sole benefit of the Owner. The Contractor agrees to endorse over to the Owner any cheques received from the federal or provincial governments as may be required to implement the foregoing failing which the Owner is authorised to deduct the amount from any Contract payment that is then or may thereafter become due to the Contractor.
2. Maintain accurate records, tabulating equipment and component costs showing all respective taxes and duties or excise taxes. At the request of the Owner, assist, join in, or at Owner's expense, make application on behalf of the Owner for any exemption, recovery or refund, and provide the Owner with copies, or where required originals of records, invoices, purchase orders or other documentation as may be necessary to support such application.

### 9. Application for Certification of Completion of a Subcontract or Early Release of Holdback

1. Determination of completion or substantial completion of a subcontract will not be made, nor will there be any early release of holdbacks for any reason.

**END OF SECTION**

## 1. GENERAL

### 1. Related Sections

1. Contractor is to thoroughly review all sections and divisions of the specification, and the drawings, to ensure that work of this section is understood together with all related items of the Contract.
2. Particular attention is drawn to the following:
  1. All Bid Forms and Supplementary Bid Forms
  2. Form of Agreement and General Conditions as modified by the Supplementary Conditions
  3. All sections of Division 01

### 2. General

1. No industry practice, norm, or standard practice by the Contractor or any Subcontractor or Supplier shall take precedence over methodology and resultant pricing for changes in the Work than that described by the Contract Documents. The Contractor, having executed the Contract, is deemed to accept the methodology and governing conditions for valuations as set out in the Contract Documents.
2. The Contractor is cautioned that in accordance with General Condition GC3.6.1 of the Contract, as modified by the Supplemental Conditions, the Contractor shall bind all Subcontractors and Suppliers to the terms and conditions of the Contract in its entirety and without exception.
3. The Contractor is cautioned that the words Markup and Overhead are defined terms in the Contract.

### 3. Field/Site Instructions and Supplemental Instructions

1. Field Instructions, Site Instructions and/or Supplemental Instructions (hereinafter called Supplemental Instructions) are issued only for the purpose of recording any clarifications or interpretation of the Contract Documents or giving direction on field conditions. These instructions are subject to the provisions of the Contract Documents and unless stated herein and specifically co-authorized by the Owner, do not affect the Contract Price or Contract Time.
2. If in the opinion of the Contractor a Supplemental Instruction involves an increase in the Contract Price or Contract Time, the Contractor shall within 7 working days of receipt of the Supplemental Instruction advise the Consultant in writing accordingly, complete with an itemized proposal. Failure to provide written notification within time stipulated shall be deemed acceptance of Supplemental Instruction by the Contractor without any increase to the Contract Price or Contract Time.
3. Where the Contractor requests a change in Contract Time or Contract Price because of the provisions of a Supplemental Instruction, the Contractor shall not proceed with any work of the Supplemental Instruction until so directed by the Owner. If the Owner accepts the proposal, the Supplemental Instructions will be issued as a Change Order.
4. Where, in the reasonable opinion of the Consultant or the Owner, the Supplemental Instruction involves a decrease in the Contract Price or Contract Time, the Consultant or the Owner through the Consultant shall advise the Contractor of such opinion, including the details of the proposed adjustment, in writing prior to the final payment being made. The Contractor shall provide satisfactory evidence that an adjustment is not warranted, failing which the Owner shall proceed to deduct the applicable amount from final payment or adjust the Contract Time, as the case may be. Where, in the opinion of the Consultant or the Owner after having reviewed the Contractor's evidence regarding adjustment, the Consultant deems that the Supplemental Instruction warrants a decrease in Contract Time or Contract Price, the Consultant or the Owner

through the Consultant shall so advise the Contractor and the matter shall be resolved in accordance with the Contract provisions for dispute, prior to release of final payment.

4. Valuation of Changes in the Work

1. Further to CCDC 2 – 2020, Part 6, the method to be used in determining the value of a change to the Work, by either Change Order or Change Directive, shall be:
  1. estimate and acceptance in a lump sum, unless the Consultant otherwise determines that the method shall be one of:
  2. unit prices set out in the Contract, at the Owner's discretion; or
  3. cost and a fee.
2. Where methods .1 or .2 (from above) are used, the Contractor shall provide the Consultant with a detailed cost analysis of the contemplated change that is in conformance with the requirements of this Section and the General and Supplemental Conditions of the Contract, indicating:
  1. quantity of each material;
  2. unit cost of each material;
  3. time involved;
  4. subtrade quotations including a complete analysis of costs.;
  5. cost of changes to bonding requirements;
  6. markups, if applicable;
  7. value of Value Added Tax as applicable; and
  8. any proposed change in Contract Time, accompanied by a clear analysis of the position of work related to the change on the critical path for achievement of Contract Time as set out in the accepted Construction Schedule. No change to Contract Time shall be allowed where the Consultant does not reasonably accept that such change to contract requirement has effect on the critical path shown on the Construction Schedule. Where the Construction Schedule fails to adequately identify critical path, it shall be deemed that there is no change to Contract Time from any proposed change in the Work.
3. Where method .3 (from above) is used, the Contractor shall propose a fee, and a method for determining cost, and any proposed change, if any, in Contract Time. A proposed change, if any, in Contract Time, shall be accompanied by a clear analysis of the position of work related to the change on the critical path for achievement of Contract Time as set out in the Construction Schedule. No change to Contract Time shall be allowed where the Consultant does not reasonably accept that such change to contract requirement has effect on the critical path shown on the Construction Schedule. Where the Construction Schedule fails to adequately identify critical path, it shall be deemed that there is no change to Contract Time from any proposed change in the Work.
4. When the change or revision involves deleted work as well as additional work, the cost of the deleted work is to be subtracted from the cost of the additional work before allowable Markup percentages are applied to the resultant total, at each stage of Subcontractor/Supplier pricing and Contractor pricing.
5. Material costs are not to exceed those published in local price guides and available to the Owner through normal direct purchase, as determined by the Consultant;
6. Labour unit costs in relation to material and Products to be installed as part of the work described by the Mechanical Divisions and Utilities Divisions of the specification are to be in accordance with the Mechanical Contractors Association of America (MCAA) Labor Estimating Manual, latest published version, at base rates and without inclusion for inefficiencies or job conditions unless with the consent of the Consultant, less 25%.
7. Labour unit costs in relation to material and Products to be installed as part of the work described by the Electrical Divisions and Utilities Divisions of the specification are to be in accordance with the National Electrical Contractors Association (NECA) Manual of Labor

Units, latest published version, at base rates and without inclusion for inefficiencies or job conditions unless with the consent of the Consultant, less 25%.

8. The following shall not be included in the cost of the change to the work, but are covered by the Subcontractor's and Contractor's Markups respectively:
  1. The Contractor's head office and site office expenses, including stationary, postage and other office supplies;
  2. The costs of the Contractor's Project Manager and administrative personnel of any kind;
  3. Use of temporary offices, sheds, small tools, etc., including the cost of telephone, light, power, water and heat used therein;
  4. Transportation and overnight room expenses for out of town labour;
  5. Insurance premiums;
  6. Licenses and permits, except when these are special for a particular item of work;
  7. Printing charges for Proposed Changes, Change Orders and Drawings for Contractor's and Subcontractors' use in the work. Consultant will provide electronic copy of change notice documentation and in the event of re-issue of full size drawings will provide one pdf electronic copy of the drawings;
  8. The cost of record drawings and shop drawings, submittals, or warranties;
  9. The cost of clean up and disposal of waste material;
  10. The cost of supervision and management;
  11. The cost of commissioning of the related Building System or Systems;
  12. The cost of rolling stock, trucks, trailers, or other Construction Equipment except as directly used in the installation of the material or Product;
  13. The cost of estimating or response to requests for documentation or clarification by the Consultant;
  14. cost of surety, unless total surety for the Contract Amount increase cumulatively exceeds 10% of initial Contract Amount; and
  15. Profit or anticipated profit.
9. The Contractor shall not be entitled to any additional compensation arising out of changes to the Work other than the amounts determined and agreed to under CCDC 2 - 2020 GC 6.2 and in accordance with this Section.
10. The maximum percentage fee for markups shall be as stated below.
11. In computing accounts for extras and credits for any Proposed Change, all credits shall be deducted from the total sum of the extras before Markup is added.
5. Permitted Markups for Valuation of Changes in the Work
  1. The maximum Markups or Overhead and Profit by the Contractor as permitted for changes to the Work shall be in accordance with the General Conditions, Supplementary Conditions, and Special Provisions of the Contract.
  2. The maximum Markups or Overhead and Profit by a Subcontractor or Supplier as permitted for changes to the Work shall be in accordance with the General Conditions, Supplementary Conditions, and Special Provisions of the Contract.
  3. The permitted Markups, Overhead and Profit are neither cumulative nor escalating. They are a one-time addition based on the net subtotal cost of the adjustment in each category and for each Subcontractor / Supplier and Contractor. Where this subtotal includes both credits and extras, Markup, Overhead or Profit apply to the net subtotal of extra and credits, if any, of the entire change.

**END OF SECTION**

## 1. GENERAL

### 1. Related Sections

1. Contractor is to thoroughly review all sections and divisions of the specification, and the drawings, to ensure that work of this section is understood together with all related items of the Contract.
2. Particular attention is drawn to the following:
  1. Form of Agreement and General Conditions as modified by the Supplementary Conditions
  2. All sections of Division 01
  3. Owners Operations and Safety and Security Conditions
  4. General Instructions and Special Project Requirements

### 2. Administrative

1. Schedule and administer project meetings throughout the progress of the Work at times and locations requested by Consultant, and at minimum twice a month for each type of meeting.
2. Prepare agenda for all meetings.
3. Distribute written notice of each meeting four days in advance of meeting date to Consultant, Owner, and all participants.
4. The Contractor shall provide physical space for all meetings. Such space shall be heated, and shall contain sufficient table size and chairs to accommodate 12 people seated. Contractor to confirm location and inform all participants. Onsite trailer is mandatory, and it is preferred that meetings take place in this trailer.
5. The Contractor shall organize and preside at meetings, except that the Consultant reserves the right to preside at meetings at any time during such meetings.
6. The Contractor records the proceedings for all meetings except the Pre-construction meeting. The Contractor submits proceedings to Consultant and Owner in draft form for review prior to distribution. Make such changes as directed by Consultant and Owner.
7. The Contractor reproduces and distributes final and revised copies of proceedings, within three days after receipt of review of drafts, to meeting participants and affected parties not in attendance.
8. Representative of Contractor attending meetings is qualified and authorised to act on behalf of the Contractor, and shall be the Project Manager, the Commissioning Co-ordinator, and the Superintendent. Subcontractors and Suppliers and representatives responsible for Building Systems shall attend all Building Systems and Commissioning workshops and meetings. They shall attend construction progress meetings when requested by Contractor, Consultant or Owner.

### 3. Pre-construction Meetings

1. Within 5 days after award of Contract, the Contractor shall schedule a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.
2. Owner, Consultant, Contractor, major Trade Contractors, field leadership personnel and Contractor's project manager and superintendent shall be in attendance.
3. Agenda to include the following:

Project Meetings

1. Appointment of official representative of participants in the Project. Confirmation of Trade Contractors and Suppliers.
  2. Status of permits, fees and requirements of authorities having jurisdiction. Action required if any.
  3. Schedule of Work and progress scheduling, review of Interim Milestones and requirements for Contract Time.
  4. Schedule of submission of samples, colour chips, or other Product selection items for Owner's consideration.
  5. Requirements for temporary facilities, site sign, offices, storage sheds, utilities.
  6. Requirements for notification for reviews. Contractor allows minimum of 48 hours notice to Consultant for reviews of Work.
  7. Delivery schedule of specified equipment.
  8. Site Security, hoarding, temporary measures, controls, and similar.
  9. Contemplated change notices, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
  10. Owner-supplied Products.
  11. Record Documents procedures and requirements.
  12. Maintenance manuals and materials requirements.
  13. Take-over procedures, acceptance, warranties.
  14. Progress claims, administrative procedures, holdbacks.
  15. Appointment of inspection and testing agencies.
  16. Insurances, transcripts of policies delivered to Owner.
  17. Building Systems and procedures for Building Systems.
  18. Procedures for waste reduction and Sustainability project requirements.
  19. Submission of Contractor's Plan, in response to Owner's Operations, Safety and Security Conditions, Requirements, for review by Owner and Consultant, and
  20. Workplace decorum.
4. At the Pre-Construction Meeting, submit drafts of all items, lists, and information requested by the Owner in its Operations, Safety and Security Plan and related documents.
  5. A further and separate Pre-Construction Meeting shall be performed by the Contractor, to specifically address and acknowledge the Contractor's Operations, Safety, and Security Plan as required by the Reference Documentation. Provide all services and perform all work for this Plan, and this meeting.
  5. A further and separate Pre-Construction Meeting shall be performed by the Contractor, to specifically address and acknowledge the Contractor's Construction Schedule, prepared and submitted as required by Section 13020. Provide all services and perform all work for preparation of the Construction Schedule, and for this meeting.
4. Progress Meetings
    1. During course of Work prior to project completion, schedule progress meetings as directed by the Consultant, and at minimum twice a month.
    2. Agenda to include the following:
      1. Review, approval of proceedings of previous meeting.
      2. Review of items arising from proceedings.
      3. Review of Work progress since previous meeting.
      4. Field observations, problems, conflicts.
      5. Solutions to conflicts that may impede the Contractor's achievement of the Contract Time in accordance with the Construction Schedule.
      6. Review of off-site fabrication delivery schedules.
      7. Corrective measures and procedures to regain projected schedule.
      8. Any proposed revisions to Construction Schedule as necessary to achieve the Contract Time.
      9. Progress, schedule during succeeding work period.
      10. Review of Submittals: expedite as required.

11. Maintenance of quality standards.
  12. Pending changes and substitutions.
  13. Review of proposed changes for effect on Construction Schedule and on Completion.
  14. Review of status of as-built documents.
  15. Review of Building Systems status, for each Building System.
  16. Review of sustainability and waste reduction measures, compliance with Project requirements.
  17. Other business.
5. Building Systems Workshops and Commissioning Meetings
1. Throughout the course of Work prior to project completion, schedule building system workshops and commissioning meetings as directed by the Consultant. Building Systems workshops shall be scheduled and held at project start and as appropriate to the Interim Milestones for Submittals and commencement of onsite work for groups of Building Systems (Structural, Mechanical, Electrical, Enclosure, etc) Commissioning meetings shall be called by the Commissioning Co-ordinator at minimum twice a month and shall correspond with either the beginning or end of the regularly scheduled construction progress meetings. Meetings shall be attended by all relevant Systems Commissioners as determined by the Consultant.
  2. The format and requirements for such meetings and record keeping and deliverables is set out in the appropriate Division 1 sections for Building Systems and for Commissioning, and in particular specification sections for individual Building Systems. Contractor and all Trade Contractors shall comply with requirements for these related services, which have monetary value within the Contract Price and Schedule of Values.
6. Pre-Takeover Meeting
1. Prior to application for Substantial Performance of the Work, Contractor schedules Pre-Takeover Meeting.
  2. Agenda to include the following:
    1. Review, approval of proceedings of previous meeting.
    2. Review of items arising from proceedings.
    3. Review of procedures and requirements for Substantial Performance of the Work, Completion of the Contract, and handover of the Work.
    4. Field observations, problems, conflicts.
    5. Solutions to problems that may impede Contract Completion.
    6. Review of procedures for deficiency review.
    7. Corrective measures required.
    8. Review of any cost-sharing arrangements for hydro, heating, and other services.
    9. Progress, schedule during succeeding work period.
    10. Review submittal requirements for warranties, manuals, and all demonstrations and documentation required for achievement of Substantial Performance of the Work and Contract Completion.
    11. Review of maintenance requirements and procedures for aspects of Work beyond the date of Substantial Performance.
    12. Review of status of as-built documents and Record Drawings.
    13. Review of Building Systems and system commissioning status, for each Building System.
    14. Review of sustainability and waste reduction, and achievement of requirements where applicable.
    15. Other business.
7. Post-Construction Meeting
1. Prior to application for final payment and Completion of the Contract, Contractor schedules Post-Construction Meeting. Four days prior to date for meeting, Consultant confirms date for meeting based on evaluation of requirements for Completion of the Contract.

2. Agenda to include the following:

1. Review, approval of proceedings of previous meeting.
2. Confirmation that no business is arising from proceedings.
3. Confirmation that the Work is finished, and handover to the Owner of all reviewed documentation from the Consultant.
4. Confirmation of any warranty items that have arisen, and status of warranty items.
5. Confirmation of results of any cost-sharing arrangements for hydro, heating, and other services.
6. Confirmation that submittal requirements for warranties, manuals, and all demonstrations and documentation for Contract Completion are in order.
7. Review of procedures for communication during post-Construction period.
8. Review of maintenance requirements and procedures for aspects of Work involving maintenance and warranty renewals by the Contractor beyond the date of Contract Completion.
9. Handover of reviewed Record Documents by Consultant to Owner.
10. Handover of Contract Completion Insurance policy transcripts by Contractor.
11. Handover of Final Application for Payment to Consultant for certificate preparation.

8. Subcontractor and Supplier Co-ordination Meetings

1. The Contractor shall hold regular Subcontractor and Supplier Co-ordination Meetings, separately from Construction Progress Meetings. Construction Progress Meetings are for the benefit of Owner and Consultant, and shall not be used to co-ordinate the work of trades.
2. The Contractor shall produce proceedings of the regularly scheduled Subcontractor and Supplier Co-ordination meetings, and shall forward such proceedings to the Owner and the Consultant for their information, on a timely basis and when issued to meeting participants.

**END OF SECTION**

## 1. GENERAL

### 1. Related Sections

1. Contractor is to thoroughly review all sections and divisions of the specification, and the drawings, to ensure that work of this section is understood together with all related items of the Contract.
2. Particular attention is drawn to the following:
  1. The Bid Forms
  2. Form of Agreement and General Conditions as modified by the Supplementary Conditions
  3. All sections of Division 01
  4. Existing Conditions Data and Reference Documents

### 2. Contract Time and Scheduling of the Work, Required Date of Substantial Performance, Interim Milestones

1. The Contractor schedules all Work in strict adherence with the Owner's requirements for the Contract Time and achievement of Substantial Performance of the Work. All costs for achieving the required date for Substantial Performance are hereby included in the Contract Price, including out-of hours and weekend work, and multiple mobilizations where necessary.
2. Construction sequencing is designed and performed by the Contractor to meet the requirements of the Contract, and is the Contractor's sole responsibility, including to incorporate any specific sequence requirements or achievement milestones shown in the Documents. Any particular sequence anticipated by the design and Owner has been indicated on the Drawings as a minimum requirement for the Work. Further design of the ways and means by which the Work is accomplished in accordance with the Contract requirements and the required sequencing is the Contractor's responsibility. Include all costs for organising the Work to achieve the Owner's sequencing requirements, including multiple mobilization of trade contractors and overtime/evening/off-hours work.
3. The Contractor shall effectively schedule, co-ordinate, and perform the Work to achieve:
  1. **By Monday, February 24, 2025, mobilization to the site, and start of the Work.**
  2. **By Monday, July 28, 2025, achievement of Occupancy (as set out in the Ontario Building Code) and ready for use by the Owner's forces, of ALL interior renovations described in construction sequencing drawings as phase 1 of the Work, by the Owner's sole judgement and criteria. This phase includes all interior renovations of the 3<sup>rd</sup> Floor complete, all renovations of the 2<sup>nd</sup> floor complete, and the entry and Dining portion of the ground floor complete.**
  3. **By Friday, October 31, 2025, Substantial Performance of the Work, as defined in the Contract. This includes all portions of the Work completed, Ready for Use to suit the operational needs of the Owner, by the Owner's sole judgment and criteria; and**
  4. **Achieve Completion of the Contract, as defined in the Contract Documents, within 30 (thirty) days of Substantial Completion of the Work.**
4. Throughout the term of the Contract Time, the Owner has established checkpoints (hereinafter called "Interim Milestones") for accomplishment of aspects of the Work, to assess construction progress in relation to the overall achievement of the Owner's Schedule requirement, and to ensure completion and hand-over in Ready for Use condition for areas of the Facility affected by the Work. The Contractor is hereby notified that the Owner may, at its option and in its sole discretion, deem failure to achieve one or any of these construction progress checkpoints as a fundamental breach of Article A-1 of the Contract, and may choose to initiate procedures under Part 7 of the general Conditions of the Contract.

The Contractor shall effectively schedule the Work to achieve the following Interim Milestone deadlines:

1. **achieve Owner's acceptance of the Contractor's proposed Construction Schedule, by 14 (fourteen) days hence from the date of Contract Award; and**
  2. **achieve Consultant's acceptance of all Product Shop Drawing submissions for the Work, by 30 (thirty) days hence from the date of Contract Award.**
  5. The Contractor shall schedule portions of the Work, where indicated by the Documents for specific time frames or periods, within those periods. Where accomplishment of the Work within specified time frames or required sequences requires weekend, holiday, off-hours, extra shifting, and overtime, include the cost of such scheduling and approach to the Work in the Contract Price. The Contractor and all Trade Contractors shall be bound by this condition. The Owner will not accept any additional cost for required organisation of the Work to meet specified time frames and sequencing of work for its aspects, including but not limited to costs.
  6. Scheduling of removals and re-roofing of existing areas of the facility, whether by base bid or by accepted Provisional or other bid Price, shall be to suit the Owner's requirements for minimal disruption to the operation of the Facility and to ensure the safety of building occupants and users in areas under the roofing operations where such areas are occupied. Design the Construction Schedule and provide all work and include all costs for multiple mobilizations to suit re-roofing of each existing area of the present facility that is scheduled for re-roofing by base bid or by accepted provisional pricing. Schedule re-roofing operations of existing areas in late spring or summer months such that roofing operations are not hampered by potential snowfall and likelihood of storms is reduced.
  7. *Construction Schedule* means the particular sequencing and performance of all aspects of the Work that achieves *Substantial Performance* of the Work within the *Contract Time* and *Completion of the Contract* to the agreed date stated in the *Contract*. The Contractor shall provide a clear and coherent document that illustrates the *Construction Schedule* pursuant to GC3.4 and as elsewhere required in the *Contract Documents*, that demonstrates how such achievement will be attained to the complete and full satisfaction of the *Owner* and *Consultant*. No alteration of the *Construction Schedule* shall alter the requirements for *Substantial Performance* of the Work within the *Contract Time*. Any alteration of the *Construction Schedule* that fails to demonstrate *Substantial Performance of the Work* within the *Contract Time* shall not be permitted nor shall be valid to govern the performance of the Work without the written consent of the *Owner* in each instance.
3. Schedules Required
1. Submit the following schedules as per the requirements of this Section:
    1. Submittals Schedule: include all submittals required under the Contract, including shop drawings, tests, and samples. Indicate dates for submitting, review time, resubmission time, float time, last date for meeting Proposed Product Delivery Schedule.
    2. Product Delivery Schedule: include dates for delivery of all equipment, finish items, and factory-finished manufactured items. Show last dates for order, shipment & delivery to meet Schedule. Schedule to be accompanied by confirmation from Suppliers and Trade Contractors regarding delivery dates for all Products on the critical path for achievement of the Construction Schedule.
    3. Construction Progress Schedule, clearly showing the critical path for achievement of the Construction Schedule
    4. Cash Flow Schedule: include anticipated progress, amounts & completion percentages.
  2. Schedules shall show critical path, identify decisions and approvals, and shall include reasonable time for Owner's and Consultant's submittal review and float time for expected weather events. Schedules that do not clear account for and include an average loss of time for

weather events and environmental conditions will be rejected. See Section 002000 regarding existing conditions, including but not limited to climate, that must be included in designing the ways and means for achieving the Contract Schedule in accordance with the Owner's requirements. Identify all elements likely to affect product development, manufacture and delivery, installation and achievement of the Construction Schedule.

4. Format of Schedules

1. Prepares schedules in the form of a horizontal bar chart, Gantt Chart style, clearly showing the main and subsidiary critical paths for achievement of the Contract.
2. Provide a separate bar for each trade or operation.
3. Provide horizontal time scale identifying the first work day of each week.
4. Schedules shall be prepared in MS Project or similar software.
5. Schedules shall show all work of the Contract, not solely onsite work. Show timelines and milestones for achievement of submittals requirements and product deliveries. Co-ordinate the Construction Schedule with the Schedule of Submittals and Product Delivery Schedule.
6. Show all Interim Milestones for the Contract and clearly demonstrate how such requirements are to be achieved.

5. Submissions

1. Submit initial schedules to Consultant within 14 days after award of Contract.
2. Distribute copies of the schedule to all concerned parties except Consultant and Owner before final submission for review.
3. Instruct recipients to report to the Contractor, within 3 calendar days, any problems anticipated by the timetable shown in the schedule to be reviewed. Upon completion of review by recipients, make necessary changes to schedule to incorporate and resolve concerns and conflicts. Submit to Consultant for review.
4. Consultant will review schedules and return reviewed copy within 7 days after receipt.
5. Resubmit schedule showing resolution of concerns, conflicts, or showing additional detail as requested in Consultant's review.
6. Submit a revised schedule with each application for payment showing progress to date.

6. Submittals Schedule

1. Include in this Schedule all submittals required under the Contract, including shop drawings, tests, and samples.
2. Indicate dates for submitting, review time, resubmission time, float time, last date for meeting Proposed Product Delivery Schedule.

7. Product Delivery Schedule

1. Include dates for delivery of all equipment, finish items, factory-finished manufactured items. Show last dates for order, shipment, and delivery in order to meet Delivery Schedule.

8. Construction Progress Schedule

1. Include the complete sequence of construction activities. Relate Schedule to Owner's requirements for use and enjoyment of the building and site, and to Owner's required milestones for completion of the Work in whole or in part. Show work to occupied and

unoccupied areas, including milestones for beginning and end of operations separately. Show relations to other schedules for Product Delivery and Submittals.

2. Show clearly through graphic diagrams accompanying schedules the approach to construction operations on the site and to existing buildings and portions thereof. Include all multiple mobilization requirements to suit the required Sequence of Construction as set out in the Documents and to suit the Owner's requirements for the existing facility operation.
3. Include in the Schedule the dates for the commencement and completion of each major element of construction and clearly track the proposed progress of building systems, including but not limited to the following:
  1. All major parts of the Work shown and broken out separately
  2. All Interim Milestones and Contract Required Milestones
  3. All Float Time co-ordinated with critical path elements of the schedule
  4. For each part of the Work
    1. Installation of Temporary Measures
    2. Full mobilization onsite
    3. Select Demolition
    4. Excavation and Foundations
    5. Structure
    6. Enclosure (roofing and wall work shown separately)
    7. Each building system involved in the Work, shown separately as a system
    8. Rough-ins and Finish timelines for all portions of the Work so organized
    9. Studs and Boardwork
    10. Flooring, Painting, Millwork, and similar areas of the Work
    11. Date for closure of ceiling spaces and installation of lay-in tiles
    12. Mechanical and Electrical Finish
    13. Commissioning, set out as start ups, system and final
    13. Specialties Finish
    14. Exterior Finishes and Landscape Surfaces
    15. Handover of the completed Portion
  5. Substantial Performance of the Work
  6. Completion of the Contract
4. Show projected percentage of completion for each item as of the first day of each week.
5. For succeeding submissions at each application for payment, indicate progress of each activity to date of submission of schedule.
6. Show changes occurring since previous submission of Schedule:
  1. Major changes in scope,
  2. Activities modified since previous submission,
  3. Revised projections of progress and completion, and
  4. Other identifiable changes.
7. Provide a narrative report to define:
  1. Problem areas, anticipated delays, and the impact on the Schedule, and
  2. Corrective action that will be immediately undertaken to regain the Construction Schedule and meet Interim Milestones.
9. Cash Flow Schedule
  1. Provide with first application for payment an estimated breakdown of contract price by claim period.

**END OF SECTION**

## 1. GENERAL

### 1. Related Sections

1. Contractor is to thoroughly review all sections and divisions of the specification, and the drawings, to ensure that work of this section is understood together with all related items of the Contract.

Particular attention is drawn to the following:

1. Form of Agreement and General Conditions as modified by the Supplementary Conditions
2. All sections of Division 01.
3. Divisions 23 and 26 of the specification, for further mechanical and electrical submission requirements.

### 2. Definitions

1. *Shop Drawings*: as defined in the Definitions portion of the Contract and GC 3.8 as amended by the Supplementary Conditions. The Contractor is cautioned that the term Shop Drawing includes many forms of submittal as necessary or requested by the documents or reasonably requested by the Consultant. Shop drawings are prepared by the Contractor to illustrate the achievement of parts of the Work, including the ways and means for such achievement. They include all items requested and required by the Contract for preparation, design, and delivery by the Contractor to the Consultant and /or Owner.
2. *Submittals* means shop drawings.
3. *Submissions* means shop drawings.
4. *Achievement of Contract Requirements for Submittals* means that the Consultant has returned to the Contractor all required Submittals in the Contract (excepting only end of contract submissions and progress payment submissions) as accepted by the Owner and Consultant. This contract requires that the Contractor achieve such Interim Milestone in accordance with the terms and conditions of the Contract. See Section 013020.

### 3. General

1. This section specifies general requirements and procedures for submittal of shop drawings, product data, testing results, samples and mock-ups to the Consultant for review, in conjunction with the submissions of a Tender Form and related documentation, and following award of a Contract. Additional specific requirements for submissions are specified elsewhere in the Contract Documents.
2. Submittals shall provide and show Contractor's design of product and material components of the Work sufficient to ensure that the submitted item accomplishes the design intent of the building systems of which it forms a whole or part. Include all costs for this design work and be responsible for it. Where design is to be undertaken by professionals, provide such work and evidence of professional designer's ability to offer such services in Ontario, and designer's liability insurance against errors and omissions. Pay all costs for this work and services.

### 4. Submittals Procedures

1. Do not proceed with manufacturing work until relevant submissions are reviewed and accepted by the Consultant. Where legislation governing the work require submittals to authorities having jurisdiction, with the sole exception of the municipal building permit, make such submission and obtain authorities approval prior to proceeding with the work.
2. Present shop drawings, product data, samples and mock-ups in same units as Contract Drawings.

3. Where items or information is not produced in metric units converted values are acceptable.
4. Contractor's responsibility for errors and omissions in submission is not relieved by Consultant's review of submissions.
5. Notify Consultant, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
6. Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by the Consultant's review of submission, unless the Consultant gives written acceptance of specific deviations.
7. Make any changes in submissions that the Consultant may require consistent with Contract Documents and resubmit as directed by Consultant.
8. Notify Consultant, in writing, when resubmitting, of any revisions other than those requested by Consultant.

## 2. SUBMISSION REQUIREMENTS

### 1. General

1. Co-ordinate each submission with requirements of work and Contract Documents. Individual submissions will not be reviewed until all related information is available.
2. Allow in the Construction Schedule and in the execution of the Work 14 Working Days for Consultant's review of each submission.
3. Accompany submissions with the submittal transmittal letter appended to this specification section, completed and signed.
4. Each submission shall bear the Subcontractor's and Contractor's stamps, signed by in each case by the Contractor's Commissioning Co-ordinator, Contractor's authorized representative, and Trade Contractors' Systems Commissioner to which the submittal may pertain, specifically certifying and stating the following: approval of submittal, verification of co-ordination with existing conditions, verification of compliance with design intent and performance of building system and co-ordination with other components of the building system, and compliance with Contract Documents.
5. Submittals must be reviewed and accepted by all Suppliers and Subcontractors in the supply chain and/or affected by the aspect of the Work to which the Submittal relates. The submitted document must bear all required reviews and acknowledgements within one document file.
6. Electronic submission of submittals through hyperlinks or manufacturer web-based processes is informal. Only pdf copy of submissions shall be considered valid, as submitted by established project FTP site or submitted by electronic mail. The Consultant will not print submittals on behalf of the Contractor or for review of submittals. The responsibility for ensuring receipt of the complete and reviewed submittal to the Consultant rests fully with the Contractor.

### 2. Shop Drawings

1. Shop Drawings shall be original drawings, or modified standard drawings provided by Contractor, to illustrate details of portions of Work, which are specific to project requirements and are prepared in order to govern production work on the shop floor. Catalogue or descriptive sales and marketing literature will not be accepted as shop drawings.
2. Submit shop drawings for complete systems and all accessories proposed for supply under this Contract. Submittal shall show details of appropriate portions of Work as applicable:

1. Design of detailed components, fastening and securement, fabrication
  2. Layout, showing dimensions, including identified dimensions and clearances.
  3. Compliance with Standards.
  4. Single line and schematic diagrams.
  5. Relationship to adjacent work.
3. Submit shop drawings as minimum of one reviewed pdf format electronic document.
  4. Cross-reference shop drawing information to applicable portions of Contract Documents.
3. Product Data
    1. Product data shall be Contractors catalogue sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products.
    2. Submit one reviewed pdf format electronic document for each product data submission.
    3. Delete information not applicable to project.
    4. Supplement standard information to provide details applicable to project and design of aspects of the Product that have been undertaken to ensure it meets the specification and the intent of the building systems of which it may form part. Provide all information regarding specific alterations and features that are being provided to meet the design intent of the building systems.
    5. Cross-reference product data information to applicable portions of Contract Documents.
    6. Where a range of colour, pattern or texture is criterion, submit full range of samples for the Product.
  4. Samples
    1. Samples are defined as physical examples that fully describe materials, equipment, finishes, and quality of such work and materials. Samples shall include duplicate copies of all finishes and surface materials for this Contract, with specified materials, indicative of quality of work and materials, and complete with any alterations required to meet the requirements of this Contract.
    2. Supply all samples to locations acceptable to Owner. Pay all costs for delivery of samples. Samples must be submitted by courier or post office mail in original physical triplicate form. No electronic scans of samples or hyperlinks to manufacturer website information may be substituted for physical samples.
    3. Reviewed and accepted sample will become standards of quality of work and materials, material, and performance against which installed work will be verified.
    4. Where a range of colour, pattern or texture is criterion, submit full range of samples.
  5. Mockups
    1. Provide all Mockups requested in other sections of the specifications and this Division.
    2. Mockups do not form part of the finished Work.
    3. Additional requests and requirements for Mockups are described in Section 017010 and in individual specification sections.
  6. Reports
    1. Provide all reports, grade sheets, commissioning and building systems reviews and tests and all similar documentation that is requested in the Contract Documents, wherever requested.

### **3. REVIEW OF SUBMITTALS, COSTS FOR REVIEW OF REJECTED SUBMISSIONS**

1. The review of submittals by the Owner and/or the Owner's Consultant is for the sole purpose of ascertaining conformance with the general concept and intent of the design of building systems, and as a precaution against error or omission on the part of the Contractor. Neither the Owner nor its Consultant approves the detail design inherent in the shop drawings or submittals, responsibility for which shall remain with the Contractor submitting same, and such review shall not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of responsibility for meeting all requirements of the Contract Documents. Without restricting the generality of the foregoing, the Contractor is responsible for dimensions to be confirmed and correlated with existing conditions, for information that pertains to fabrication processes or to techniques of construction and installation and for co-ordination of the portions of the Work.
2. The Consultant reviews submittals once only at Owner's expense. Failure to submit shop drawings in accordance with Contract requirements will result in a finding of defective work under the General Conditions of the Contract, and the Consultant will re-review any submission that has been rejected at the Contractor's expense as deducted from the Contract Price and paid to the Consultant by the Owner as reimbursement for additional services to the Consultant's contract for services with the Owner.

**END OF SECTION**

# Contractor's Letterhead

## Submittal Transmittal

84 Frederick Street Renovations *Project*  
 Region of Waterloo *Owner*  
 \_\_\_\_\_ *Contractor*

\_\_\_\_\_ *Title of Submittal*  
 \_\_\_\_\_ *Submission sched ref*  
 \_\_\_\_\_ *Date initiated*  
 \_\_\_\_\_ *Spec section*  
 \_\_\_\_\_ *Building System(s)*

We, \_\_\_\_\_, hereby enclose the following portion of the Work which is required by the Contract Documents. We understand and agree that in submitting we are acknowledging that this Submittal is complete and meets all Contract Requirements outlined in the Specifications. We have examined this Submittal, verified field measurements unless otherwise noted, and certify compliance with the Contract. We have examined General Condition 3.10 as amended by the Supplementary Conditions and Division 1 of the specification, and understand that GC 2.4.3 may apply to this Submittal.

**THE ORIGINAL OF THIS FORM REMAINS WITH THE ORIGINAL SUBMITTAL AT ALL TIMES.  
 RETAIN A COPY FOR YOUR RECORDS.**

**CONTRACTOR COMPLETES THE FOLLOWING:**

Submittal is: \_\_\_\_\_ *First Submission* \_\_\_\_\_ *Resubmission*  
 \_\_\_\_\_ *Interference Dwg.* \_\_\_\_\_ *Shop Drawing*  
 \_\_\_\_\_ *Product Description* \_\_\_\_\_ *Sample*

Submittal Consists of: \_\_\_\_\_ *1 interactive PDF file* \_\_\_\_\_ *Other*

If Submittal requires professional design, proof of the professional's liability insurance is enclosed.

[Contractor's name and signature] \_\_\_\_\_ Date: \_\_\_\_\_

**CONSULTANT TEAM AND OWNER COMPLETE ONGOING RECORD OF TRANSMITTAL**

To:	From:	Copies	Comment	Date Sent	Date Rec'd
Contractor					
JMA	Contractor	1 pdf			
	JMA				
JMA					
Contractor	JMA				

RECORD OF REVIEW	1 REVIEWED	2 REVIEWED AS NOTED	3 REVISE AND RESUBMIT	4 NOT REVIEWED
Supplier/Trade Contractor				
System Commissioner				
Bldg. System Commissioner				
Contractor's Project Manager				
Owner				
SubConsultant				
JMA				

## 1. GENERAL

### 1. Related Sections

1. Contractor is to thoroughly review all sections and divisions of the specification, and the drawings, to ensure that work of this section is understood together with all related items of the Contract.
2. Particular attention is drawn to the following:
  1. Form of Agreement and General Conditions as modified by the Supplementary Conditions
  2. All sections of Division 01.

### 2. Definitions

1. The Contractor is hereby directed to the definition of *Work* in this Contract. *Work* means the total construction and related services required by the Contract Documents. The related services are deemed to have monetary value within the Contract Amount, and failure to perform such services to a standard required by the Contract shall result in findings of Defective Work under GC2.4.3.
2. The Contractor is hereby directed to the definitions of *Building System* and *commissioning* in this Contract, and the required work for the co-ordination of each Building System (Section 019010) and the performance of commissioning services (Section 018010) described elsewhere in Division 01.
3. The word *co-ordination* is used in the Contract Documents as an abbreviation which refers to all the services required and described in GC3.1 Control of the Work and this Section.

### 3. Requirement

1. The Contractor is hereby directed to General Condition 3.1 Control of the Work. The Contractor shall totally control, shall effectively direct, and shall supervise the Work, and shall ensure conformity with the Contract Documents. The Contractor shall design, execute, and monitor all means, methods, techniques, and procedures with respect to the performance of the Work, and shall co-ordinate the various parts of the Work under the Contract.
2. In accordance with requirements described elsewhere in Division 01, the Contractor shall clearly demonstrate to the Consultant and Owner the planning, communications, layout, monitoring, scheduling, and interrelation of the construction and related services that shall achieve the requirements of the Contract. The Contractor shall perform the Work in accordance with same.
3. The Contractor shall bind all Suppliers and Subcontractors to co-ordination requirements described herein, so that the requirements of this Section are the responsibility of particular Suppliers and Subcontractors with respect to aspects of the construction, in equal measure to the Contractor's overall responsibilities for the total construction.

## 2. LAYOUT OF THE PARTS OF THE CONSTRUCTION

1. The Contractor, and in particular the supervisor, shall be responsible for the following layout activities:
  1. Measurement, location, laying out, determination of levels and positioning of all parts of the construction. The Contractor shall ensure that all Suppliers and Subcontractors co-operate fully in the performance of these tasks, but may not delegate or assign these tasks to any other person

or entity save and except a qualified land surveyor licensed to practice at the Place of the Work (for layout of site elements).

2. Among other duties the Contractor is responsible for location and co-ordination of openings, access doors, sleeves, cutting and patching, holing, blocking and support, and accessories.

### **3. CO-ORDINATION OF BUILDING SYSTEMS AND COMMISSIONING**

1. Unless specifically stated in the Contract, the Contractor, and in particular the Site Supervisor, shall be responsible for the planning, sequencing, control, and co-ordination of all components of specific Building Systems so that Building Systems requirements as described elsewhere in Division 01, including performance in service, are achieved. Where assignment to a Supplier or Subcontractor is specifically stated in the Documents, such Supplier or Subcontractor shall be equally responsible with the Contractor.
2. The nominated personnel responsible for the planning, sequencing, control, and co-ordination of all components of a specific Building System (the System Commissioner) shall design the execution of the work related to the Building System and co-ordinate such design with other aspects of the Work, including other Building Systems. The nominated Commissioning Co-ordinator and System Commissioners shall, with respect to each building system, perform all start up, system commissioning and final commissioning and verification as set out in Section 018010.
3. The nominated personnel shall review and accept the execution as it progresses, and submit written reports regarding the progress and quality of the execution.
4. All costs for co-ordination of Building Systems and performance of commissioning services by the Contractor and Trade Contractors, including troubleshooting and problem resolution services, are included in the Contract Price.

### **4. SERVICES AND UTILITY SYSTEMS**

1. Consult with utility companies and other authorities having jurisdiction to ascertain the locations of existing services on or adjacent to site.
2. Information as to the location of existing services, if shown on the Drawings, does not relieve the Contractor of responsibility to determine the exact number and location of existing services.
3. Give proper notices for new services as may be required. Make arrangements with authorities and utilities for service connections required.
4. Pay any charges levied by utilities or authorities for work carried out by them in connection with this Contract, unless specified otherwise.
5. Report existing unknown services encountered during excavation to Consultant for instructions; cut back and cap or plug unused services. Be responsible for the protection of all active services encountered and for repair of such services if damaged. All services shown, indicated, or noted on Reference Documents are by definition known services, not unknown.

### **5. INTERFERENCES**

1. The Contractor, and in particular the Site Supervisor, shall be responsible for co-ordinating the parts of the construction and the sequencing of operations to ensure that portions of the construction are installed in a timely and efficient sequence that minimises interference amongst components of the construction.

1. Ensure that delivery and placement of items is co-ordinated so that items can be delivered and installed in the best sizes and least number of components without compromise because of access restrictions caused by existing portions of the construction.
2. Ensure equipment and fixture placing allows for proper accommodation of the item in the space provided, without compromise.
3. Ensure that accesses and clearance required by jurisdictional authorities and/or for easy maintenance of equipment are provided in the laying out of equipment and services.
4. Bring any potential concerns regarding interferences to the attention of the Consultant during the Contractor's review of Submissions.
5. In all cases where the Contractor has any uncertainty regarding means and methods of properly accommodating required elements of the construction, and immediately upon receiving accepted submissions for components of Building Systems affected by such uncertainty, the Contractor shall prepare sequencing and interference co-ordination drawings that clearly describe how the requirements are to be achieved. Pay all costs for this work, and issue such drawings to all parties involved in the affected work, and to the Consultant.

## 6. CUTTING AND PATCHING

1. Perform the total construction and related services so that requirements for cutting and alteration of existing portions of the construction are eliminated wherever possible. Where not possible, perform cutting and patching using trades fully qualified in the installation of the material being cut. Trades installing the item requiring to pass through do not perform the cutting and patching.
2. In advance of necessary cutting or alteration:
  1. Submit a description of such operations where they may affect:
    1. Structural integrity of any element of Project or Facility, whether new or existing.
    2. Integrity of weather-exposed or moisture-resistant elements.
    3. Efficiency, ease of maintenance, or safety of any operational element.
    4. Visual qualities of sight-exposed elements.
    5. Areas adjacent to or beyond identified project sites within the building.
  2. Include in description:
    1. Identification of Project.
    2. Location and description of affected work.
    3. Statement on necessity for cutting or alteration.
    4. Description of proposed work, and products to be used, forces to be employed and their qualification to perform the work.
    5. Alternatives to cutting and patching.
    6. Date and time work will be executed.
    7. Intended methods for reduction of noise and dust generation to achieve minimum disturbance.
3. Do not proceed with cutting work before receipt of Owner's acceptance of description. Where such work may be deemed hot work or risk of arc weld glare, conform with submission and all requirements of Division 01 sections for safety and fire safety.
4. General Requirements for Cutting and Patching:
  1. Provide all cutting and patching, including excavation and fill, necessary to complete the Work.
  2. Fit the several parts together, to integrate with other work.

3. Uncover work to install ill-timed work.
4. Remove and replace defective and non-conforming work.
5. Remove samples of installed work for testing.
6. Provide openings in non-structural elements of existing elements and new work for penetrations of mechanical, electrical, or other work.
5. Locate existing services prior to cutting operation, including a thorough examination of as-built drawings and onsite locates to determine presence and location of electrical, mechanical, communication, or other services. When cutting grades, finishes, slabs-on-grade, ensure to locate services and conduit both within and below surface finishes.
6. Inspection
  1. Inspect existing conditions, including elements subject to damage or movement during cutting and patching, or during relocation.
  2. After uncovering; inspect conditions affecting quality of the work.
  3. Commencement of cutting or patching means acceptance of existing conditions.
7. Costs of Work
  1. Perform all cutting and patching required to install new components and products whether to integrate with existing components and products, to integrate with existing site conditions, or to integrate with other new components and products required.
  2. Pay for all costs for this work.
8. Location of Equipment, Devices, and Fixtures
  1. Consider the location of fixtures, outlets, and mechanical and electrical items indicated as approximate unless otherwise specifically dimensioned or noted.
  2. Inform the Consultant of a conflicting installation. Install as directed.

## **7. COSTS FOR REMEDIAL WORK CAUSED BY FAILURE TO PERFORM**

1. Upon failure to perform the services and execute any aspect of the Work in accordance with the requirements of this Section, make all necessary changes and pay all costs to correct the execution of the Work, including replacements, removals, repairs, and making good to adjacent construction affected.
2. Perform the changes, pay the costs, and make good the damage at no additional cost to the Owner.
3. There shall be no change to the Contract Time for any remedial actions made necessary by failure to perform the Work of this Section.
4. In lieu of instructions for remedial action, failure to perform the services required by this Section to Contract standards may result in findings of Defective Work under GC2.4.3. This finding may include a reduction in the Contract Price as determined by the Consultant in accordance with the General Conditions and Supplementary Conditions. The reduction in Contract Price shall include the cost of Consultant re-review and additional services to the Consultant's contract with the Owner.

**END OF SECTION**

## 1. GENERAL

### 1. Related Sections

1. Contractor is to thoroughly review all sections and divisions of the specification, and the drawings, to ensure that work of this section is understood together with all related items of the Contract.
2. Particular attention is drawn to the following:
  1. Form of Agreement and General Conditions as modified by the Supplementary Conditions
  2. All sections of Division 01

### 2. Reference Standards and Codes

1. Within the text of the specifications, reference may be made to the following organizations and standards or norms associated with same:

AASHO	- American Association of State Highway Officials
ACI	- American Concrete Institute
ACNBC	- Associate Committee on the National Building Code
ADA	- Americans with Disabilities Act
Ag Can	- Agriculture Canada
ASHRAE	- American Society for Heating, Refrigeration & Air Conditioning Engineers
AGA	- American Gas Association
ASME	- American Society of Mechanical Engineers
ASPE	- American Society of Plumbing Engineers
ASTM	- American Society for Testing of Materials
AWWA	- American Water Works Association
CAN	- National Standard of Canada designation (1/CGA, 2/CGSB, 3/CSA, 4/ULC)
CCA	- Canadian Construction Association
CCMC	- Canadian Construction Materials Centre
CEC	- Canadian Electrical Code (published by CSA)
CFUA	- Canadian Fire Underwriters' Association
CGA	- Canadian Gas Association
CGBC	- Canadian Green Buildings Council
CGSB	- Canadian General Standards Board
CIQS	- Canadian Institute of Quantity Surveyors
CNTA	- Canadian Nursery Trades' Association
COFI	- Council of Forest Industries of British Columbia
CSA	- Canadian Standards Association
CSC	- Construction Specifications Canada
CSI	- Construction Specifications Institute (USA)
CSPI	- Corrugated Steel Pipe Institute
CUA	- Canadian Underwriters' Association
EEMAC	- Electrical and Electronic Manufacturers Association of Canada
EIDO	- Electrical Inspection Department of Ontario Hydro
ESA	- Electrical Safety Authority (Ontario)
ESC	- Electrical Safety Code
FCC	- Fire Commissioner of Canada
GC	- General Agreements
GS	- Green Seal
HI	- Hydronics Institute (USA)
IESNA	- Illuminating Engineering Society of North America
ISO	- International Organisation for Standardisation
LEED	- Leadership in Energy Environmental Design
MCAA	- Mechanical Contractors Association of America

Reference Standards and Codes

MOECC	- Ontario Ministry of the Environment and Climate Change
MTC, MTO	- Ministry of Transport and Communications, Ontario
NBC	- National Building Code of Canada (OBC takes precedence in case of conflict)
NBFU	- National Board of Fire Underwriters
NBS	- National Bureau of Standards (USDC)
NECA	- National Electrical Contractors Association
NEMA	- National Electrical Manufacturers' Association
NFC	- National Fire Code of Canada (note OFC takes precedence in case of conflict)
NFPA	- National Fire Prevention Association
NRC	- National Research Council
OAA	- Ontario Association of Architects
OBC	- Ontario Building Code
ODA	- Ontarians with Disabilities Act
OESC	- Ontario Electrical Safety Code
OFC	- Ontario Fire Code
OFM	- Ontario Fire Marshal's Office
OGUC	- Ontario Gas Utilization Code
OHSA	- Occupational Health and Safety Act
OGCA	- Ontario General Contractors' Association
OPSS	- Ontario Provincial Standard Specification
OPSD	- Ontario Provincial Standard Drawing
PCI	- Precast Concrete Institute
PEO	- Professional Engineers Ontario
RAIC	- Royal Architectural Institute of Canada
SCAQMD	- State of California, South Coast Air Quality Management District
TSSA	- Technical Standards and Safety Authority
ULC	- Underwriters Laboratories of Canada
ULI	- Underwriter's Laboratories Incorporated
USGBC	- United States Green Buildings Council
WSIB	- Workplace Safety and Insurance Board

2. Conform to the recommendations of these organizations for good practice, standards of use, recommendations and codes, in whole or in part, in their most recently revised or amended form, as specifically requested in the Specification and as applicable in normal industry practice:
  1. to the execution of the Work,
  2. to the interrelation of Products and their components,
  3. to the installation of such Products and execution of related services.
3. If there is question as to whether any Product, installation, or system is in conformance with applicable standards, the Consultant reserves the right to have such products, installations, or systems tested to prove or disprove conformance.
4. The cost for such testing will be borne by the Owner in the event of conformance with Contract Documents or by the Contractor in the event of non-conformance.

**END OF SECTION**

## 1. GENERAL

### 1. Related Sections

1. In accordance with this Section and Division 1 requirements for Quality Control, Commissioning, and Building Systems, any re-review, re-inspection, or re-testing by Owner's Consultants or Owner's Testing and Inspection Agencies is at Contractor's cost through offset to Contract Price. This applies wherever items of the Work have not successfully passed standards or Contract requirements during initial review, inspection, or testing performed.
2. Contractor is to thoroughly review all sections and divisions of the specification, and the drawings, to ensure that work of this section is understood together with all related items of the Contract.
3. Particular attention is drawn to the following:
  1. Form of Agreement and General Conditions as modified by the Supplementary Conditions
  2. All sections of Division 01

### 2. Definitions

1. *Tolerance*: means allowable deviation from specific dimensions, criteria and/or sizes which is to be shared and co-ordinated by the Contractor within *Building Systems*, among products, materials and their adjacent components. In general, tolerances shall be in accordance with best recommended practice for each aspect of the Work as determined by referral to specific requirements as set out in each section of the specification pertaining to such work, this Section, Codes and Standards referenced in the Contract Documents, and by referral to written recommendations of Product Suppliers for specific products and materials to be installed in the Work.
2. *Plumb and/or level*: means plumb or level within 1/8" (3mm) in 10'-0" (3000mm) in any given direction whether along, across, or on any portion of the Work, either vertically or horizontally as the case may be.
3. *Square*: means within 10 seconds greater or lesser than 90 degrees.
4. *Straight*: means within 1/8" (3mm) of a line described only by start and end point extended on an edge, surface, or plane in any single direction up to 10'-0" (3000mm) in length.
5. Where an aspect of the Work is installed more than 5/8" (16mm) from its intended location, such Product and/or material is by definition located beyond acceptable tolerance. The Consultant may render a finding that such work is deemed Defective Work in accordance with the General Conditions of the Contract. The Consultant may instruct that such aspects, including other portions of the Work upon which the aspect relies or supports, to be removed, relocated, re-installed, or otherwise remediated to achieve required tolerances in the Work. Such work shall be performed by the Contractor and affected Trade Contractors at no additional expense to the Contract, and without change to the Contract Time.

### 3. Submittals

1. Submit name and qualifications of quality control personnel to Owner.
2. On request of Owner submit documentation to verify accuracy of field engineering work.
3. Submit certification that elevations and locations of completed Work are in conformance with Contract Documents on request of Consultant.
4. Submit bi-weekly quality controls reports to Consultant and Owner, for their information and record, identifying deficiencies and defects in the Work, and action(s) taken or to be taken.

4. Reports
  1. Submit copies of inspection and test reports promptly to the Consultant. Provide copies to Subcontractor of work being inspected/ tested.
5. Tests and Mix Designs
  1. Furnish test results and mix designs as may be requested by the Consultant, and as requested elsewhere in the Contract Documents.
  2. Refusal by a Supplier or Subcontractor to submit mix designs or Product tests for review shall be deemed an acceptance of responsibility by that Supplier or Subcontractor for all aspects of the Work affected by any subsequent failure of the mix or Product in the Work, or for any detrimental effect to other aspects of the Work in the relation of the Product to such aspects.
  3. The cost of tests and mix designs beyond those called for in the Contract Documents or beyond those required by the Law of the Place of Work shall be appraised by the Consultant and may be authorised as recoverable. Testing by the Contractor in accordance with Subcontracts shall be paid by the Contractor.
6. Building Systems, Commissioning and Verification
  1. Submit pre-installation, installation, and verification reports for Building Systems, including but not limited to mechanical and electrical systems, as set out in Division 01 requirements and in particular sections of the specifications for each Building System. Submit such reports in accordance with the Construction Schedule and the Commissioning Plan.
  2. Submit reports of personnel assigned to quality control for specific Building Systems as described elsewhere in Division 1 and in particular specification sections for each Building System.
7. Costs of Tests
  1. Contractor pays for all reports, verifications, reviews, inspection and tests identified in the Contract Documents except those tests and inspections specifically noted for payment under the Testing Allowance or for performance by Authorities, the Owner, or the Consultant.

## **2. REVIEWS AND INSPECTIONS**

1. Refer to GC 2.3.
2. The Owner & Consultant shall have access to the Work. If parts of the Work are in preparation at locations other than the Place of the Work, access shall be given to such work whenever in progress.
3. Give timely notice requesting review if Work is designated for special tests, reviews by Consultants, inspections by Inspectors, verification in the commissioning process, or review by authorities having jurisdiction.
4. If the Contractor covers or permits to be covered Work that has been designated for special tests, reviews, inspections or approvals before such is made, uncover such Work, have the inspections or tests satisfactorily completed and make good such Work at no cost to the Owner.
5. The Consultant may order any part of the Work to be examined if such work is suspected to be not in accordance with the Contract Documents.
6. The Consultant's general review of the Work is for purposes of informing the Owner of the general progress and quality of the Work. It does not relieve the Contractor of full responsibility for inspection and examination of the Work in whole and in part to ensure compliance with the Contract Documents.

7. The Contractor shall bring to the Consultant's attention any part of the Work which does not conform to the requirements of the Contract Documents, and shall provide such remedial measures, Products and labour required to correct such parts of the Work in order that they meet the requirements of the Contract Documents with no cost to the Owner or Consultant.
8. The Contractor acknowledges that inspection and supervision form an integral part of the Work, and that failure to fully provide such work constitutes a reduction in the value of the Contract which will result in a commensurate decrease in the Contract Price through a change to the Work in accordance with GC 2.4.3 should the Consultant find that such a decrease is warranted.

### **3. INDEPENDENT INSPECTION FIRMS**

#### **1. General**

1. Independent Inspection/Testing Firms may be engaged by the Owner for the purpose of inspecting and/or testing portions of Work, for the Owner's quality control purposes.
2. Costs for such Owner quality control work shall be allocated as described elsewhere in Div. 1.
3. Provide equipment required for executing inspection and testing by the appointed firms.
4. Employment of inspection/testing Firms does not relax the Contractor's responsibility to perform Work in accordance with the Contract Documents, and to supervise and inspect the progress of the Work to ensure performance of the Work in accordance with the Contract Documents. Where the Contractor wishes to have tests or inspection performed to assure of such performance, the Contractor shall arrange such tests, pay all costs, and shall make test results available to the Consultant and Owner.
5. If defects are revealed during inspection and/or testing, the appointed firm will request additional inspection and/or testing to ascertain full degree of defect. Correct defects and irregularities as advised by Consultant at no cost to the Owner. The Contractor shall pay costs for re-testing and re-inspection.

#### **2. Access To Work**

1. Allow the Owner's inspection/testing firms access to the Work and its performance wherever it is taking place, including offsite manufacturing and fabrication plants. Co-operate to provide reasonable facilities for such access.

#### **3. Procedures**

1. Notify the appropriate firm and Consultant in advance of the requirement for tests, in order that attendance arrangements can be made.
2. Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in an orderly sequence so as not to delay in Work.
3. Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

### **4. DEFECTIVE WORK, NON-CONFORMING WORK**

1. Refer to GC 2.4 and GC5.9 as amended by the Supplementary Conditions.
2. Remove defective work, whether the result of poor workmanship, use of defective products or damage and whether incorporated in the Work or not, which has been rejected by the Consultant as failing to conform to the Contract Documents. Replace or re-execute the work in accordance with the Contract Documents.

3. Promptly make good other Contractor's work and/or existing conditions affected by the Work that is damaged by such removals or replacements to correct defective work.
4. If in the opinion of the Consultant it is not expedient to correct defective work or work not performed in accordance with the Contract Documents, the Owner may deduct from the Contract Price the difference in value between the work performed and that called for by the Contract Documents, the amount of which shall be found by the Consultant. This amount shall include for costs the Owner may bear for additional services of the Consultant.
5. No payment by the Owner, nor use of the construction or a portion thereof shall constitute an acceptance of any portion of the Work that is not in accordance with the requirements of the Contract Documents.

## 5. FIELD ENGINEERING

1. Qualifications
  1. Personnel experienced and fully capable of operating levelling and measuring equipment, establishing reference points, performing building layouts, taking and transferring levels, and recording data and information in log form, as proposed by Contractor and acceptable to Owner and Consultant. For survey reference and layout of foundations and the location of all foundation walls and structural columns, the work must be performed by a registered surveyor.
2. Survey Reference
  1. Establish existing base horizontal, control points, and vertical points in conjunction with Owner at commencement of project. Preserve permanent reference points during construction.
  2. Make no changes or relocations without prior written notice to Owner.
  3. Report to Owner when a reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
  4. Replace control points in accordance with original control.
3. Survey Requirements
  1. Establish a permanent bench mark on site using a qualified land surveyor, referenced to established bench marks and survey control points. Record locations, with horizontal and vertical data in Project Record Documents. Do not deface existing portions of the construction that will remain exposed in the final Work.
  2. Establish all locations of foundation walls, building columns and main structural elements using a qualified land surveyor.
  3. Establish excavation, founding elevations, top of foundation, ceiling, roof and floor elevations using a registered land surveyor.
  4. Establish lines and levels, site dimensions, locates and lay outs for all services, floors, and other surfaces, all by instrumentation.
  5. Establish conduit and pipe invert elevations and cover to finished grade by instrumentation and provide completed Grade Sheets for each underground service, using the attached sample Grade Sheet format that follows this Section.
  6. Establish rough grades, sub-base and base course levels and profiles, and finished grades.
  7. Establish lines and levels for mechanical and electrical work.

8. Establish rates of rise and fall for roofing, surfaces governed by requirements for the disabled, drainage surfaces, and authorities.
4. Records
  1. Maintain a complete, accurate log of control work as it progresses, including construction photographs as noted elsewhere in Division One.
  2. On completion of underground work, prepare an as-built drawing showing dimensions, locations, angles and elevations of services both existing and new. Relate new work to the existing layout and universal geodetic locations. Submit individual grade sheets for each service.

## **6. CONCEALED OR UNKNOWN CONDITIONS**

1. Promptly notify the Consultant in writing if subsurface conditions at the Place of the Work differ materially from those discerned from the Contractor's inspection of the site, Contract Documents, and existing documentation outlined in Section 002200 and incorporated into the completed Bid Forms, or a reasonable assumption of probable conditions based thereon.
2. After prompt investigation, should Consultant determine that the conditions do differ materially, instructions will be issued for changes in the Work.
3. Follow instructions issued by Owner and Consultant and co-ordinate any changes to the Work required.

**END OF SECTION**

## 1. GENERAL

### 1. Related Sections

1. Contractor is to thoroughly review all sections and divisions of the specification, and the drawings, to ensure that work of this section is understood together with all related items of the Contract. Carefully read and correlate information in this Section with requirements of sections 015033 and 015034.
2. Particular attention is drawn to the following:
  1. Form of Agreement and General Conditions as modified by the Supplementary Conditions
  2. Existing Conditions and Reference Documents
  3. General Requirements Division 01
  4. Site Grading and Surface Drainage System Section 312200
  5. Special Project Requirements Section 011020

### 2. Installation of Temporary Facilities

1. Provide temporary construction facilities in order to execute work expeditiously, and maintain temporary facilities in good operating order.
2. Use of Owner's temporary facilities is prohibited. Contractor to provide all such items.
3. Remove temporary facilities from site when directed by Consultant, and prior to application for Substantial Completion. Return areas, equipment, and items to a clean, neat, and "as existing" or "as new" condition as applicable. Make good all damage promptly at no cost to the Owner.

### 3. Site Office Facilities

1. A site office is required at the site, within the existing areas of the building. A Site trailer is not required for this purpose.

### 4. Telephone Facilities

1. Maintain cellular wireless telephone service for duration of project. Do not use Owner's existing telephone service. Telephone service shall be c/w voicemail. Voicemail shall be checked regularly to ensure that calls will be received and a recording able to be made at all times.

### 5. Sanitary Facilities

1. The Contractor shall provide its own temporary sanitary facilities and maintain such facilities in accordance with applicable workplace legislation and to clean and odour-free standards. Pay all costs for temporary sanitary facilities.

### 6. First Aid Facilities

1. Provide adequate first aid facilities to exceed requirements of applicable workplace legislation.

### 7. Site Signs and Notices

1. No other signs or advertisements, other than signs for erection or display as requested by Owner, warning signs, or signs required by law, are permitted on site, without Owner's consent.
2. Notices for safety or similar instruction are permitted on site, and are to be in English language, or use commonly understood graphic symbols.
3. Maintain signs and notices for duration of project. Remove and dispose of signs off site when directed by Consultant.

8. Parking Facilities

1. There is NO parking available at the Place of the Work. Parking is available outside the property bounds, in paid Municipal parking lots and on paid street parking. All costs for parking by Contractor and Contractor's forces is at the Contractor's expense. All fines for illegal parking are at the Contractor expense.

9. Delivery Facilities

1. All deliveries shall take place at the Site in an efficient and timely manner, and vehicles shall be immediately off-loaded and removed from the Site. Post signage to indicate delivery requirements. All delivery orders shall be accompanied by clear instructions regarding how to access the Site, during what hours, and by what arrangements.

10. Site Storage/Loading Facilities

1. Provide adequate and secure storage for materials and equipment. Do not store materials provided under the Contract offsite after payment for such items has been applied for. Provide such storage within the bounds of the Place of the Work under the control of the Contractor. Pay all costs for such storage. In accordance with CCDC 2 - 2020, GC 3.1.1 as modified by the Supplementary Conditions.
2. Confine work and operations of employees to limits indicated by Contract Documents or where no limits shown on drawings, to immediate area of work. Do not unreasonably encumber premises with products.
3. On-site storage of construction materials and equipment shall be kept to a minimum at all times. All materials being stored shall be protected by the Contractor from damage or loss and shall be repaired or replaced by the Contractor should damage or loss occur.
4. Do not load or permit to load any part of work with a weight or force that will endanger the work, or any part of existing structures, components or elements.
5. Do not store goods and materials within existing buildings except with Owner's prior permission. Materials are to be stored in a location and manner to cause the least interference with work activities, pedestrian or vehicular traffic.
6. Where storage is not permitted within existing buildings, provide lockable sheds and trailers to store goods and materials. Pay parking costs associated with storage trailers.
7. Determine with the Owner those locations that are suitable for receiving and storage of materials and equipment.
8. All materials and equipment shall be kept in a secure area, at contractor's expense, or removed from the job site when work is not actually in progress.

11. Hoisting Facilities

1. Provide, operate and maintain hoists and cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for use thereof.
2. Hoists and cranes shall be operated by qualified operator.
3. Where Contractor chooses to erect a crane to facilitate ways and means of construction, submit proposed crane location for acceptance by Owner and provide all design and installation for the crane foundation. Provide evidence of how the crane function and operation will not trespass or overlap areas of the property and existing building that are occupied and used by the Owner and the public, with fail safe procedures.

12. Elevator Facilities

1. The existing building passenger elevator may NOT be used for hoisting purposes, access to upper floors by Contractor, Trade Contractor or Suppliers, for delivery or transportation of materials, or for any other purpose. Access to the Roof shall be via existing stairs.
2. The existing service lift may NOT be used for hoisting purposes, or for transportation of materials, or for any other purpose for use by the Owner, or the Owner's lift maintenance personnel.

13. Equipment, Tool and Materials Storage Facilities

1. Materials may be stored in building subject to other requirements regarding overloading structure and Owner's ongoing use.
2. Where materials cannot be stored in building, provide and maintain, in a clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
3. Locate materials not required to be stored in weatherproof sheds on site in a manner to cause least interference with work activities.

14. Scaffolding and Shoring

1. Construct and maintain scaffolding and shoring in rigid, secure and safe manner, should scaffolding or shoring be required. Pay all costs. Design of scaffolding is the sole responsibility of the Contractor, and shall conform to applicable codes and standards for such items.
2. Erect scaffolding independent of walls, without interference to other work in progress.

15. Construction Aids

1. Provide temporary stairs, ladders, ramps required for movement and placing of Products and materials, equipment, and personnel. Provide mechanical hoisting equipment and fully qualified operators as required during construction.

16. Waste Disposal Facilities and Services

1. Provide for garbage chutes, on-site debris collection and disposal equipment, and services needed to dispose of all debris. Do not use Owner's waste containers for disposal of debris arising from work of this Contract. Provide and pay for dedicated waste disposal for work of this Contract. Conform with requirements of Section 017042.

17. Removal of Temporary Facilities

1. Remove temporary facilities from site when directed by Consultant, and prior to application for Substantial Performance of the Work. Return areas, equipment, and items to a clean, neat, and "as existing" or "as new" condition as applicable. Make good all damage promptly at no cost to Owner.
2. Return Owner's and Consultant signs in good condition, salvaged from the Place of the Work upon completion of the Work or when directed by the Consultant.

**END OF SECTION**

## 1. GENERAL

### 1. Related Sections

1. Contractor is to thoroughly review all sections and divisions of the specification, and the drawings, to ensure that work of this section is understood together with all related items of the Contract. Carefully read and correlate information in this Section with requirements of sections 015010 and 015034.
2. Particular attention is drawn to the following:
  1. Form of Agreement & General Conditions as modified by the Supplementary Conditions
  2. Existing Conditions and Reference Documents
  3. General Requirements Division 01
  4. Temporary Facilities Section 015010
  5. Temporary Utilities Section 015034
3. The requirements of this Section apply to all other Sections of the specifications.

### 2. Installation of Temporary Controls

1. Provide temporary controls in order to execute work expeditiously. Maintain temporary controls and plant in good operating order. Remove from site all such work after use.

### 3. Site Access Control

1. Access to the Site for construction operations shall be via the existing gate within site fencing, from Queen Street to the West, using the adjacent property owner's laneway. This includes for deliveries, haulage, personnel access. The Owner shall make arrangements for use of the laneway access.
2. Where such access is not available, access may be from Frederick street, with all applicable road permits obtained by Contractor, and included in the Contract Price.
3. Maintain access at all times to all properties, and the existing facility in accordance with the required Sequence of Construction conditions. Do not encumber driveways, and walkways.
4. Pay all costs for protection of and provision of temporary access to the building, site, and roadways for any activity or vehicle that may damage same. Ensure that temporary load distribution methods are employed over all substrates to ensure that wheel loading and movement of vehicles does not over-compact, crack, or otherwise damage existing surface finishes or underlying items such as service lines.

### 4. Hoarding, Safety and Security

1. The safety and security requirements for this Contract include the requirement to separate the Place of the Work, to communicate and liaise, and to co-operate fully with the Owner's operations, safety and security protocols. Obtain a copy of such protocols from the Owner. The Contractor shall pay all costs for this part of the Work.
2. Provide separations as required to meet requirements of Ministry of Labour and other authorities having jurisdiction, to completely separate the area of the Work from other portions of the property, and to form a continuous security separation line. Provide enclosures to:
  1. Exterior works, provide fence, minimum of 6' (1,830mm) high. Such fencing shall be as necessary in the Contractor's sole opinion to secure the site to meet safety and security standards applicable to this Project. Provide an operable and lockable gate to facilitate delivery of Products and materials. Provide temporary enclosures to all work areas on the Property outside the Site demarcation line, where construction operations are occurring in such areas.

3. Ensure security of both the area of the Work and areas within the site that interface with the existing facility against vandalism so that the security of the existing facility and the progress of the Work is not compromised. Provide temporary security alarm system, video surveillance, and/or onsite security staffing if deemed necessary by the Owner or the Consultant, at no cost to the Owner, where security issues or incidents make evident to the Owner that the Contractor's measures are inadequate.
  4. Hoarded area shall include outdoor storage areas, garbage bins, all exterior work operations, and at other hazardous exterior work areas. Unless otherwise indicated, or as otherwise agreed with the Owner and as may be required by legislation, acceptable exterior hoarding shall be min. 1,830mm (6'-0") high plywood on wood framing or "InstaFence" (905) 842-3545 portable fencing. Panels must be provided with T base suitable for pinning and shall be clipped together at top corners. Contractor remains solely responsible for site security and safety and shall supplement these requirements as necessary. Erect hoarding as required to protect all persons, and all public and private property from injury and damage. Ensure conformance with all requirements of authorities having jurisdiction.
  5. Interior hoarding shall be provided to separate occupied areas from construction areas, in accordance with the sequence of construction, and further to locations at the sole discretion of the Contractor, or where required by Authorities, ensure exiting / egress is maintained and provide panic hardware as required.
5. Enclosure of Structures and Temporary Protection of the Work
1. Provide temporary weather-tight enclosures and protection for exterior openings until permanently enclosed. Contractor shall be deemed to have included requirements for temporary protection reasonably inferable from Contractor's examination of data required by Section 002000 into the Contract Amount and Contract Time.
  2. Erect enclosures to allow access for installation of materials and working inside enclosure. Construct enclosures complete as required to provide continuous conditions acceptable for the preparation of substrates, application of Products, curing or drying of Products, and protection until handover of the Work.
  3. Design of enclosures is solely by the Contractor. Design enclosures to withstand wind pressure and snow loading if exposed to such loading.
6. Barriers and Restraints
1. Provide temporary barriers to protect the workforce and the public from operations and risks.
  2. Provide temporary systems of restraints and anchorages in accordance with regulations and requirements of the Occupational Health and Safety Act and other applicable regulations. Design, erect, and maintain such facilities at no cost to the Owner.
7. Scaffolding and Shoring
1. Provide and maintain scaffolding and shoring in rigid, secure and safe manner, should scaffolding or shoring be required. Design of scaffolding is the sole responsibility of the Contractor, and shall conform to applicable codes and standards for such items. Erect scaffolding independent of walls, without interfering with work in progress.
8. Guards, Guardrails, Barricades and Warning Notices
1. Comply with stricter of applicable legislation or the following.
  2. Erect guards and other barricades to protect all persons, public and private property from injury or damage.

3. Provide barricades and covered walkways required by governing authorities for public rights of way and for public access to building.
  5. Erect signs to prohibit entry of unauthorized personnel into work areas, particularly when building remains occupied by the Owner.
  6. Erect walkways, hoarding, guards, or other protective measures and directional devices required to provide persons with safe access to the building. Temporary accesses shall permit persons to have access to the buildings over excavated areas by means of duckboards or other suitable measures to keep persons free of mud or other tracking and soiling substances. Temporary lighting to a minimum level of 2 footcandles shall be provided for lighting of the walkways at all times.
  7. Assume full responsibility for any damage or injury caused due to failure to comply with provisions of the Contract Documents.
  8. Provide and maintain all required signage, construction barriers, dust screens etc. to adequately restrict and protect the public from the work site and the work being undertaken.
  9. Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs, and as otherwise required by governing authorities.
  10. Wherever the Contractor's work may expose persons to danger, provide all necessary protection to prevent injury and post notices advising of the hazard.
  11. The Safety railing Systems described in Section 055200 are not temporary controls, and shall not be used as temporary controls.
9. Weathertight Enclosures
1. Provide temporary weather-tight enclosures and protection for exterior openings until permanently enclosed. Contractor shall be deemed to have included requirements for temporary protection reasonably inferable from Contractor's examination of data required by Section 002000 into the Contract Amount and Contract Time.
  2. Erect enclosures to allow access for installation of materials and working inside enclosure. Construct enclosures complete as required to provide continuous conditions acceptable for the preparation of substrates, application of Products, curing or drying of Products, and protection until handover of the Work.
  3. Design of enclosures is solely by the Contractor. Design enclosures to withstand wind pressure and snow loading if exposed to such loading.
  4. Ensure that existing building enclosure is weather-tight at all times throughout select demolition and new construction to these existing enclosure elements (walls, roofs, below grade, without exception).
10. Security Control
1. Ensure that building is maintained locked at all times, except when doors are unlocked and continuously monitored by Contractor. Comply with Owner's security requirements. Comply with Owner's directives regarding security. Where the existing building enclosure is opened, breached, or otherwise compromised by work of this Contract, install temporary closures to prevent unauthorized entry.
  2. Comply with Owner's security requirements and directives in the Reference Documents.
  3. Refer also to other sections for security provisions during periods when building systems are out of service.

11. Dust Controls

1. In addition to the requirements of other Sections, provide dust tight screens or partitions to localize dust-generating activities, and for protection of workers, and finished areas of Work. Provide a complete dust proof enclosure to separate the areas of the Work from all other areas of the existing facility, at no further expense to the Owner.
2. Provide dust screens, covers, cloths, or other appropriate dust protection to keep surfaces, furnishings, equipment, fittings, and occupants' personal effects remaining in work spaces during work, completely free from dust and debris arising from the Work. Dust barriers shall be full height and be sealed to floors, ceilings and walls.
3. Install temporary filters to existing facility mechanical grilles, louvers, exhausts, etc., unless the Owner has consented to disconnect the equipment involved in which case seal off with temporary plastic sheet dust barriers.
4. Maintain and relocate protection until such Work is complete. Undertake demolition, cutting or holing work that may generate dust with wet methods to minimize dust generation wherever possible. Remove upon completion of dust-generating work, and make clean areas affected.

12. Odour Controls

1. Where work, such as painting, or roofing, will generate odours, take measures to limit migration of odours outside immediate work area and limit effect on workers.
2. Limit migration of odours to adjacent portions of facility, neighbourhood, and property.
3. Where odour generating activities take place after the facility has been occupied by the Owner, acceptable measures for odour control include working outside normal working hours to permit smells to dissipate by the time Owner's personnel return to work, or by ventilating. Only as a last resort, and the absence of any other acceptable measure, arrange shutdown of Owner's air handling equipment, and /or Owner's operations.

13. Noise & Vibration Control

1. Limit adverse impact of noise generating operations on adjacent areas and properties. Undertake Work in strict conformance with Municipality's Noise By-laws. Take all efforts to limit adverse impact of vibration generating operations to the existing Facility structure and enclosure systems.

14. Erosion & Sedimentation Controls

1. Provide erosion and sedimentation control measures as indicated on the drawings and as described herein, to the satisfaction of the Consultant and as required by authorities having jurisdiction, prior to commencement of construction, and during the construction period as the work progresses, in consideration of the sequence of construction. Where such measures are required to be relocated to accommodate construction sequence, re-install to as new condition.
2. Erosion and sedimentation control measures to remain in place until completion of construction, or until such periods further described herein.
3. Silt Sacks
  1. Provide silt sacks constructed of woven polypropylene filter fabric, to all catch basins located within the Courtyard, so that suspended sediments from new courtyard finish operations, are collected and filtered from storm water runoff prior to flowing into permanent drainage systems. Inspect silt sacks after every major rainfall, and at a minimum of once per week. Remove, dump, clean and replace silt sack whenever sack is greater than 50% full, and as requested by the Consultant, Owner, or Authorities, at no additional cost to the Owner.

4. Construction Entry Mud-Mat – N/A this Project
5. Silt Fencing
  1. Provide silt fencing along the complete length of the North, West and South sides of the courtyard, adjacent to existing chain-link fencing. Construct fencing of pervious filter fabric, to prevent the loss of granular and fill materials from the construction site resulting from storm water run-off, wind erosion and construction activities and as follows. Woven polypropylene filter fabric, purpose-made and to acceptance of authorities. Fence posts shall be spaced a maximum of 10'-0" (3.0m) on centre. Fabric shall be embedded in soil to a depth of 18" (450mm) and have compact soil holding it in place.
  2. Inspect fencing for depth of sediment, tears, detachment of fabric from fence posts, channel erosion beneath fence, sagging, collapse, and to ensure fence posts are firmly in the ground. Where such damage is found repair fence to as new condition. Remove and dispose sediments when sediments reach one third height of fence.
  3. Install silt fencing prior to start of exterior removals within the Courtyard.
  4. Maintain fencing until new hardscape finishes within the courtyard are complete.
6. Check Dams – N/A this Project
7. Temporary Erosion Protection
  1. Provide temporary erosion protection of areas to receive sodding and mechanical seeding for the period between placement of topsoil and planting/seeding activities. Protection shall consist of Geotextile Fabric shall be Terrafix 270R or similar. Anchor and overlap fabric as per manufacturer's recommendation. Provide positive lapping in direction of drainage.
  2. Prepare the subgrade, including applications of fertilizer and seed. Place geotextile fabric on finished topsoil or earth.
8. Provide all erosion and sedimentation control measures to foundation excavations as may be required to ensure stable slopes to excavations.
15. Storm Water Controls - Dewatering and Drainage
  1. Provide temporary drainage facilities during re-roofing operations, to redirect STM water from scuppers and rain water leaders from roofs to STM structures or grade. Do not allow STM flow from roofs or scuppers to flow unencumbered from open ends of such components. Provide temporary piping and redirect STM flow away from re-roofing operations, from building entries at grade, and from adjacent properties.
  2. Provide temporary site drainage complete with erosion and sedimentation control measures to eliminate erosion, siltation, danger to the public and staff, and to prevent infiltration of solids into permanent drainage systems on the site and to adjacent Municipal services.
  3. Ensure backup controls in case of failure of primary systems.
  4. Maintain free and clear all existing STM controls.
15. Traffic Controls
  1. Provide and maintain notices, flag-persons, traffic signals, barricades and flares, lights, or lanterns as required to perform the work and protect the public.

16. Protection of Work in Progress
  1. Provide all temporary protection required to minimise damage to the Work as it progresses. Contractor makes good to new, or replaces portions of work damaged through failure to protect, as directed by the Consultant, at no cost to the Owner.
17. Protection for Off Site and Public Property
  1. Protect surrounding private and public property from damage during performance work. Be responsible for damage incurred.
18. Protection of Building Finishes and Equipment
  1. Provide protection for finished and partially finished building finishes, furniture and equipment during performance of work. Provide necessary screens, covers, and hoardings as required. Be responsible for damage incurred due to lack of or improper protection.
19. Tree Protection
  1. Provide barriers around existing trees in raised landscaped planters along Frederick Street, and protect them from damage from heavy machinery, deliveries, or construction activities, where required during the accomplishment of the Work. Do not store materials, dispose of materials, flush excess water, load, or otherwise disturb the area within the drip-line.
  2. Provide tree protection at no cost to Owner and to ensure trees are not damaged by construction operations. Protection must take the form of transparent fast-fencing or similar, minimum 4'-0" (1,220mm) high, erected at tree drip-line, and as further described in the Documents.
20. Lock Out-Tag Out (LOTO) Procedures
  1. Provide all Lock Out-Tag Out (LOTO) procedures in strict conformance with Owner requirements. See also Bid Documents. Where there is risk of injury to both the Owner and the Contractor's personnel due to equipment re-activation, employ double lockout procedures, with each of the Contractor and the Owner providing separately keyed locks and tags to the switches. Do not remove locks and tags until each party's responsible has: independently ascertained that no injury will be caused to personnel by re-activating the equipment; and verified to the other party that no injury will be caused to personnel by re-activating the equipment.

**END OF SECTION**

## 1. GENERAL

### 1. Related Sections

1. Contractor is to thoroughly review all sections and divisions of the specification, and the drawings, to ensure that work of this section is understood together with all related items of the Contract. Carefully read and correlate information in this Section with requirements of sections 015010 and 015033.
2. Particular attention is drawn to the following:
  1. Form of Agreement & General Conditions as modified by the Supplementary Conditions
  2. Existing Conditions & Reference Documents
  3. General Requirements Division 01
  4. Temporary Facilities Section 015010
  5. Temporary Controls Section 015033
3. The requirements of this Section apply to all other Sections of the specifications.

### 2. Installation, Maintenance and Removal

1. Provide temporary utilities in order to execute work expeditiously.
2. Remove from site all such work after use.
3. Maintain temporary utilities and plant in good operating order.
4. Use utilities and execute work to prevent waste of utilities.

### 3. Water Supply

1. There is site water supply piping existing in the Facility, that may be used in the Work by the Contractor. The Contractor shall pay for all costs of hooking up any temporary items to permit such uses by authorities having jurisdiction and utilities, including meters, connection fees, utility charges, installation of back-flow prevention, and inspections, where required.

### 4. Temporary Heating and Cooling and Humidity Control

1. Contractor pays for costs for all temporary heating and cooling required for the Work. Use of direct-fired heaters discharging waste products into work areas is not permitted while areas are occupied by the workforce. Contractor pays for all temporary heating, cooling, and ventilation costs to temper and ventilate spaces containing hazardous gases or materials and excessive dust. New or existing facility building systems may not be used for this purpose unless financial arrangements are made with the Owner and Contractor pays cost of all provision of metering.
2. Provide temporary humidity control, heating and/or cooling in enclosed areas as required to:
  1. Facilitate progress of work.
  2. Protect work and products against dampness and cold.
  3. Prevent moisture condensation on surfaces.
  4. Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
  5. Provide adequate ventilation and temperature conditions to meet health regulations for a safe working environment. Provide this particular ventilation as a separate system to the exterior.
3. Construction heaters used inside building must be vented to outside or be flameless type. Solid fuel salamanders not permitted. Maintain fire watch during use of open flame heaters near the building and to material stockpiles.

4. Do not use electricity for temporary heating.
5. Maintain temperatures of minimum 10°C and maximum of 26°C in areas where construction is in progress, unless indicated otherwise, or as may be required by manufacturer's instructions for materials being installed during heating period.
6. Maintain minimum temperature of 15°C or higher where specified as soon as finishing work is commenced and maintain until acceptance of structure by Owner.
7. Permanent heating cooling and ventilation systems of building, or portions thereof, may not be used for temporary heating cooling or ventilation. Permanent system may be used for building flush-out.
8. On completion of building flush out for which permanent heating system is used as construction heating, replace permanent filters, and leave equipment clean.
9. There is presently natural gas piping supply system at the facility, on the existing roof adjacent the Place of the Work. Use of gas for temporary heating shall only be at the expense of the Contractor.
10. With Owner's permission, temporary connection may be made to the natural gas service, for construction purposes. Provide meter, and compensate Owner for cost of fuel consumed at Owner's costs. Obtain all necessary permits and inspections. Owner shall be final authority to determine costs. Provide all other piping, fittings, connections, hoses, etc. as required for temporary connection.
11. Be responsible for damage to work due to failure in providing adequate heat and protection during construction.
12. Prevent excessive use or waste of utilities, and minimize utility costs to Owner.
13. Maintain strict supervision of operation of temporary heating equipment to:
  1. Conform to applicable codes and standards.
  2. Enforce safe practices.
  3. Prevent abuse of services.
  4. Prevent damage to finishes.
  5. Vent direct fired combustion units to outside.
14. Temporary Heating/Cooling of Occupied Areas
  1. Where existing roof-top units that are supplying heating, cooling and ventilation to occupied areas of the building, are taken off line in order to facilitate re-roofing operations, Contractor shall provide all temporary heating, cooling and ventilation requirements as necessary to maintain set-points and to ensure Outdoor Air.
  2. During cold weather, maintain temperatures of minimum 19°C and maximum of 22°C. Provide adjustments to such set-points, to Owner's instructions.
  3. During hot weather, maintain temperatures of minimum 21°C and maximum of 24°C. Provide adjustments to such set-points, to Owner's instructions.
  4. Provide ventilation for outdoor air in accordance with building uses, occupant loads of spaces, ASHRAE standards, and requirements of Region of Waterloo Public Health.
  5. All costs for temporary measures to provide heating, cooling and ventilation to occupied areas during re-roofing operations are included in the Contract Price. No additional costs shall be accepted by Consultant or Owner for such measures.

5. Temporary Ventilation

1. Ventilate heated areas to keep building free of exhaust and combustion gases. Do not use existing systems for this purpose.
2. Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
3. Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
4. Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
5. Ventilate storage spaces containing hazardous or volatile materials.
6. Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.
7. Maintain strict supervision of operation of temporary heating and ventilating equipment to:
  1. Conform to applicable codes and standards.
  2. Enforce safe practices.
  3. Prevent abuse of services.
  4. Prevent damage to finishes.
  5. Vent direct fired combustion units to outside.
8. New equipment and systems shall not be used for temporary ventilating.

6. Temporary Power and Light

1. There is existing electrical power at the Place of the Work, at the existing Facility. All work for the installation of temporary power and lighting to requirements of the Contract for working conditions, including provision of temporary lighting, fixtures and devices, and feed runs from the Facility's nearest available source of power, shall be provided and maintained at the Contractor's expense.
2. Contractor pays for all connections and equipment required for any temporary site office, trailers, or communication equipment.
3. Provide and maintain temporary lighting throughout project. Level of illumination on all floors shall not be less than 5 foot-candles (54 Lx) for all boardwork, painting, and further finishing of the Work.
4. Do not use facility electricity to provide temporary construction heating except with permission of Owner and credit to the Contract Price.

7. Temporary Telephone and Internet Service

1. Provide and pay for cellular wireless telephone and datacom/internet services for own use and use of Consultant and Owner.
2. Telephone and datacom/internet service shall be separate from Owner's existing utility services.
3. Telephone service shall be complete with answering machine or voice mail.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Contractor is responsible for all aspects of safety.

### 2. Related Sections

1. Contractor is to thoroughly review all sections and divisions of the specification, and the drawings, to ensure that work of this section is understood together with all related items of the Contract.
2. Particular attention is drawn to the following:
  1. Form of Agreement and General Conditions as modified by the Supplementary Conditions.
  2. Existing Conditions Documentation including all Reference Documents.
  3. All sections of Division 01.

### 3. Construction Safety Measures and Reference Standards

1. Observe and enforce construction safety measures including but not limited to the Occupational Health and Safety Act, National Building Code 1990 Part 8, provincial government regulations, Workplace Safety Insurance Board requirements, WHMIS legislation and instructions, and applicable municipal statutes and authorities, all as amended in their latest edition.
2. The "Constructor" named in the latest addition of the Occupational Health and Safety Act, and the Workplace Safety Insurance Board Regulations, of the Province of Ontario, including any amendments, shall mean the Contractor for the work performed under this Contract, including work under Cash and Contingency Allowances.
3. In event of conflict between any provisions of authorities the most stringent provision governs and is included in the Contract Price and Contract Time.
4. Fire Safety Requirements: in accordance with Section 015046
5. Overloading: Ensure no part of Work is subjected to a load which will endanger its safety or will cause permanent deformation.
6. Falsework: Design and construct falsework in accordance with CSA S269.1-1975.
7. Scaffolding: Design and construct scaffolding in accordance with CSA S269.2-M1980.
8. Shoring and Underpinning: Design and perform shoring and underpinning operations in accordance with applicable legislation, reference Codes and Standards, and the OHSA. Be fully responsible for the design and performance of such systems, as they form part of the ways and means for accomplishment of the Work. Note that structural design of building is for finished installation of components and systems only.
9. First Aid Facilities: Provide for duration of Contract site equipment and medical facilities necessary to supply first-aid service to injured personnel and in accordance with regulations in force from authorities having jurisdiction and in accordance with the Owner's requirements under its Operations, Safety, and Security Plan.

**END OF SECTION**

## 1. GENERAL

### 1. Related Sections

1. Contractor is to thoroughly review all sections and divisions of the specification, and the drawings, to ensure that work of this section is understood together with all related items of the contract.

Particular attention is drawn to the following:

1. Form of Agreement and General Conditions as modified by the Supplementary Conditions
2. Section 002000 and Owner's Operations, Safety and Security Conditions
3. All sections of Division 01
4. Section 015045 Safety Requirements

### 2. General

1. Comply with requirements of FCC no. 301 Standard for Construction Operations, June 1982, or its latest edition or amendment, as issued by Fire Commissioner of Canada (FCC), and part 8 of the NBC. The more stringent requirements shall apply in all cases. Ensure that risk of fire is minimized, and that protective measures for controlling and extinguishing fire are in place prior to beginning any aspects of the work.
2. The existing fire alarm system and existing sprinkler system in the Facility must remain operational and cover the complete building at all times except by infrequent and special arrangement with the Owner and the local Fire Department in each instance. Pay all costs to maintain these systems and make these special arrangements.

### 3. Fire Protection and Fire Safety

1. Provide temporary fire protection throughout the period of construction, to new areas, to areas under the control of the Contractor, and to minimize risk to adjacent areas of the Facility under the Owner's control and occupancy.
2. Particular attention shall be paid to the elimination of fire hazards.
3. Take all necessary precautions to prevent fires, and to prevent damage to buildings, materials, personnel, equipment, furnishings and chattels.
4. Provide fire extinguishers as required by the stricter of the Occupational Health and Safety Act and regulations made thereunder, and the Ontario Fire Code.
5. Comply with the Owner's directives regarding fire safety.
6. All hot work must involve a fire watch for minimum 2 hours following completion of the work, and for such further time as the Contractor deems necessary to definitively rule out risk of fire from the hot work operation.
7. Electric & Gas Welding & Cutting Operations: Conduct all work involving electric and gas welding and cutting and grinding operations in accordance with the safety standards specified in the latest edition of CSA W117.
8. Flammable Liquids: Flammable liquids are to be kept to a minimum and shall be stored in approved safety containers. Do not store such materials or liquids in the building or structure, regardless of state of completion.
9. Fire: In the event of a fire call the municipal emergency response 911. Regardless of whether the fire is extinguished without using the City of Waterloo Fire Department response, immediately notify Owner and make full report of the fire incident.

10. Emergency Telephone Numbers: be advised of the following emergency services contact telephone numbers
  1. Region of Waterloo Ambulance, Fire and Police Service: 911
  2. Hospital: Contractor shall obtain and post this emergency response number.
  
4. False Fire Alarms
  1. Reimburse the Owner, by means of a deduction from any amounts due the Contractor by the Owner, for all costs related to false alarms of the fire alarm system or the security alarm system attributable to acts or omissions of the Contractor. Costs shall include charges levied by local authorities, charges levied by the Owner's alarm monitoring service, labour and expense costs for Owner's staff to attend at site in response to a false alarm, Consultant's cost related to any work for a false alarm, all to a minimum of \$500 per false alarm incident.
  
5. Fire Alarm Activation
  1. A fire alarm system that has been activated by other than testing shall not be reset until the cause of the alarm has been investigated and until authorized by the Owner or the Fire Department.
  
6. Fire Protection Systems or Equipment Impairment
  1. Take all precautions when fire protection equipment (nearby hydrants, sprinklers, chemical fire suppression systems, standpipes, fire extinguishers, related water service, etc.) is taken out of service, including but not limited to restricting all hot work operations and hazardous processes.
  2. Take measures to minimize the shut down or impairment of use of fire protection. Plan operations required to reduce system impairment time to the least amount possible.
  3. Advise Owner of complete or partial impairment of fire protection system, including time required, areas affected, etc., in accordance with Section 015034 Utilities and Owner's Operation, Safety, and Security Conditions, for Building System Service Interruptions.
  4. Provide temporary protection such as extra extinguishers during all periods of fire protection equipment impairment.
  5. If fire protection system is restorable, either in whole or in part, assign personnel during the period of impairment to restore the system promptly in the event of a fire.
  6. During periods when existing fire protection systems (fire alarm, sprinkler system) is interrupted, establish and maintain a fire watch, including but not limited to the following:
    1. Patrol all corridors and high-risk areas affected.
    2. Fire patrol shall have immediate access to a phone to call 911 if they see a fire.
    3. Report all other problems encountered.
    4. Remain on patrol until fire protection system is returned to full operation.

**END OF SECTION**

## 1. GENERAL

### 1. Related Sections

1. Contractor is to thoroughly review all sections and divisions of the specification, and the drawings, to ensure that work of this section is understood together with all related items of the Contract. Only some aspects of waste management, recycling, and environmental controls are described by this Section. Other Sections contain further requirements for these and other items relating to protection of the environment.
2. Particular attention is drawn to the following:
  1. Form of Agreement and General Conditions as modified by the Supplementary Conditions
  2. All sections of Division 01, especially sustainability and waste reduction requirements
  3. All sections of Divisions 02, 20, 26, and to the site.

### 2. Fires

1. Fires and burning of rubbish on the site or the Owner's property are not permitted.

### 3. Disposal of Wastes

1. Do not bury rubbish and waste materials on site. Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.
2. Dispose of waste, excess material created by demolition or excavation or changes to grade, toxic substances, hazardous materials and designated substances in accordance with requirements of manufacturer and authorities having jurisdiction, all at no cost to the Owner. Only such substances that cannot be anticipated by a thorough inspection of the site and examination of the Existing Conditions and Reference Documents shall be deemed exempt from this requirement for work and cost borne by the Contractor.

### 4. Pollution Control

1. Provide and maintain temporary erosion and pollution control features.
2. Control gas and noise emissions from equipment to the requirements of applicable reference standards and codes, and to Owner's and local authorities requirements. Arrange and pay for all required permits for such emissions from authorities having jurisdiction.
3. Cover and/or wet down dry materials and rubbish to prevent blowing dust and debris. Seed areas not immediately receiving cover finishes to ensure dust and loss of soil are minimized.

### 5. Recycling Of Materials

1. This Project requires compliance with Ontario regulations and criteria regarding the preparation and execution of waste reduction and recycling plans. The Contractor shall prepare, submit, obtain approvals, pay all fees, execute and ensure compliance with such plans at no expense to the Owner. See also Section 017042.
2. In any case, regardless of applicable legislative and regulatory requirements, deliver to nearest appropriate depot all materials accepted for recycling by the region or municipality having jurisdiction over the place of the Work, including but not limited to cardboard, paper, plastic, aluminum, gypsum wallboard, steel, and glass. Deliver to nearest appropriate depot all scrap and excess material for recycling of this material. Pay all costs for this work.

6. Hazardous Materials and Designated Substances
  1. This Project requires compliance with Ontario regulations and criteria regarding the handling and care for the presence of, or potential presence of, Toxic Materials, Hazardous Materials, or Designated Substances under the Environmental laws of the Place of the Work, and OHSA.
  2. Perform all work with due care for the presence of such materials, either in Existing Conditions or within aspects of Products or materials for the Work.
  3. Stop aspects of the Work as appropriate and immediately inform Consultant and Owner should the presence of any such material be suspected unless the material has already been identified and work processes put in place to perform the Work in the presence of such material.
7. *Toxic or Hazardous Substances or Materials* means, collectively or individually, any contaminant, waste, subject waste, pollutant (as defined in the Environmental Protection Act (Ontario) and regulations thereunder), toxic substance (as defined in the Environmental Protection Act (Canada), dangerous goods (as defined in the Transportation of Dangerous Goods Act (Canada) and regulations thereunder), asbestos (as defined in the Occupational Health and Safety Act (Ontario) and regulations thereunder), petroleum, its derivatives, by-products or other hydrocarbons, as defined in or pursuant to any applicable, laws, regulations, by-laws, guidelines or orders rendered by any governmental authority or any other substance or material which when released to or present in the natural environment may cause in some immediate or foreseeable future time, material harm or degradation of the environment or material risk to human health, whether or not defined in any federal, provincial, territorial or municipal laws, statutes or regulations.

**END OF SECTION**

## 1. GENERAL

### 1. Related Sections

1. Contractor is to thoroughly review all sections and divisions of the specification, and the drawings, to ensure that work of this section is understood together with all related items of the Contract.
2. Particular attention is drawn to the following:
  1. Form of Agreement and General Conditions as modified by the Supplementary Conditions
  2. All sections of Division 01, and in particular Section 019010, Building Systems Requirements
  3. Existing Conditions

### 2. Definitions

1. *Product* is defined in accordance with the Definitions of the Contract as "material, machinery, equipment, and fixtures forming the Work, but does not include Construction Equipment."
2. *Construction Equipment* is defined in accordance with the Definitions of the Contract as "all machinery and equipment, either operated or not operated, that is required for preparing, fabricating, conveying, erecting or otherwise performing the Work but is not incorporated into the Work."
3. *Supplier* is defined in accordance with the Definitions of the Contract as "a person or entity having a direct contract with the Contractor to supply Products."
4. *Supply* is hereby further defined for the purposes of this Contract as "perform all work required to deliver Products FOB the designated site in undamaged, new condition in accordance with the Agreement, General Conditions as modified by the Supplementary Conditions, Co-ordination, Schedule, and Product requirements of this Section 016010 and the Contract. The term *supply* shall be deemed inclusive of all applicable costs for manufacture, protection, storage, loading and unloading, demurrage, transportation, insurance, fees for royalties or patent rights, all duties, and all taxes excepting only the Harmonized Sales Tax. The term *supply* shall be read to mean in all cases "supply by the Contractor as part of the Work" unless the context specifically states that the Owner or Consultant or authority having jurisdiction shall supply.
5. *Install* is as defined in Section 017010 Basic Execution Requirements.
6. *Provide* is defined in accordance with the Definitions of the Contract as "to supply and install." The term *provide* shall be read to mean in all cases "provide by the Contractor as part of the Work" unless the context specifically states that the Owner or Consultant or authority having jurisdiction shall provide.
7. *Recycled Content*: is the percentage by weight of recycled material that is in a Product or material brought onto site.
8. *Post-Consumer Recycled Content*: is the percentage of material in a product that was consumer waste. The recycled material was generated by household, commercial, industrial, or institutional end-users and can no longer be used for its intended purpose. It includes returns of materials from the distribution chain (ISO 14021). Examples include construction and demolition debris, materials collected through recycling programs, discarded products (e.g., furniture, cabinetry, decking), and landscaping waste (e.g., leaves, grass clippings, tree trimmings).

9. *Pre-Consumer (Post-Industrial) Recycled Content*: is the percentage of material in a product that is recycled from manufacturing waste. Examples include planer shavings, sawdust, bagasse, walnut shells, culls, trimmed materials, overissue publications, and obsolete inventories. Excluded are rework, regrind, or scrap materials capable of being reclaimed within the same process that generated them (ISO 14021).
10. *In-House Process Recycled Content*: is the trimmings, cutoffs and scrap that are returned to the production process as a part of internal housekeeping.
11. *Manufacturing Location*: is the last point of processing or assembly (e.g., A sawmill that turns harvested trees into framing lumber which is then used on-site).
12. *Extraction Location*: is the origin of material inputs that are transported to Manufacturing Location (e.g., location of forests where trees for framing lumber were harvested from).

### 3. General

1. Supply Products in accordance with the procedures for scheduling the Work as described elsewhere in Division 01. Supply Products in a timely manner so as not to impede the progress of the Work.
2. Supply Products in accordance with the procedures for Submittals as described elsewhere in Division 01. Supply Products as identified on reviewed and accepted Submittals.
3. Supply Products in accordance with Special Procedures as described elsewhere in Division 01.
4. Supply Products in accordance with requirements for co-ordination of the Work as described elsewhere in Division 01.
5. Supply Products in accordance with requirements for temporary facilities and safety as described elsewhere in Division 01.
6. Supply Products in accordance with Contract objectives for sustainability including but not limited to following:
  1. minimize ecological footprint of building by specifically selecting materials that conserve raw and non-renewable resources wherever possible.
  2. minimize amount of energy expended in transportation of materials to site through intentional sourcing of regional materials wherever possible.
  3. source and select materials that meet sustainability criteria detailed within technical Sections.
  4. minimize packaging and participate in pallet return programs and other sustainable methods of waste management and disposal. See also Section 017042, Waste Management and Disposal.

### 4. Products Supplied by Owner

1. Where products are supplied only by the Owner for incorporation into work of this Contract, do the following as part of the work of this Contract, without charge:
  1. Unload and handle products and materials at site.
  2. Promptly inspect delivered products, and give written report to Consultant on condition of items received.
  3. Pay demurrage charges.
  4. Install, connect and finish products specified.
  5. Remove packaging material from site and clean products.

### 5. Reference Standards

1. State of California, South Coast Air Quality Management District (SCAQMD) Rule 1168. July 2005 (as amended January 2005).

2. State of California, South Coast Air Quality Management District (SCAQMD) Rule 1113. January 2004.
3. Green Seal, Paints (GS-11). May 1993.
4. Green Seal, Anti-Corrosive Paints (GS-03). January 1997.
5. Green Seal, Commercial Adhesives (GS-36). October 2000.

## 2. PRODUCTS

### 1. Quality

1. Products, materials, equipment and articles (referred to as Products throughout the specifications) incorporated in the work shall be new, not damaged or defective, and of the best quality (to exceed specifications requirements) for the purpose intended. If requested, furnish evidence as to type, source and quality of Products. Where documents specifically request refurbished or reclaimed materials, the standard of acceptance for quality of such products shall be as set out in the documents and to the satisfaction of the Consultant and Owner.
2. Defective Products, whether identified prior or after delivery, installation, or during warranty periods, will be rejected, regardless of previous inspections, reviews, or certifications for payment. Inspection and review does not relieve Contractor's responsibility, but is a precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
3. Should any dispute arise as to the quality or fitness of Products, the decision rests strictly with the Consultant based upon the requirements of the Contract Documents.
4. Unless otherwise indicated in the specifications, maintain uniformity of manufacture for any particular or like item throughout the Work.
5. Permanent labels, trademarks and nameplates on products are not acceptable, except where required for operating instructions, or when located in mechanical or electrical rooms.

### 2. Availability

1. Immediately upon signing the Contract, review product delivery requirements and anticipate foreseeable supply delays for any items. If delays in supply of items are foreseeable, notify the Consultant of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Contract.
2. In the event of failure to notify the Consultant and should it subsequently appear that work may be delayed for such reason, the Consultant reserves the right to substitute more readily available items of similar character, at no increase in Contract Price.

### 3. Manufacturer's Instructions

1. All Products shall be supplied with written manufacturers' instructions for care, handling, transportation, installation, start up and commissioning suitable for the specific purposes and conditions intended in the Work.
2. Notify the Consultant in writing, of conflicts between the Contract requirements and manufacturer's instructions, so Consultant may establish the course of action.
3. Improper installation or erection of Suppliers' products due to failure in complying with these requirements authorizes the Consultant to require removal, and reinstallation at no increase in Contract Price.

4. Transportation
  1. Pay costs of transportation FOB to the site of products required in the performance of the Work.
  2. Transportation cost of products supplied by the Owner will be paid for by the Owner. Unload, handle and store such products at Contractor's own expense.
5. Storage, Handling, and Protection
  1. Handle and store products in a manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instruction when applicable.
  2. Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in the work.
  3. Store products subject to damage from weather in weatherproof enclosures.
  4. Store cementitious products clear of earth or concrete floors, and away from walls.
  5. Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
  6. Store components and equipment in accordance with Supplier instructions.
  7. Store and mix paints in a heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.
  8. Immediately remove and replace damaged or rejected materials from the work site at own expense and to the satisfaction of the Consultant.
6. Labels and Trademarks
  1. Trademarks and labels including applied labels are not to be visible in finished work, except that an engraved name of manufacturer and model number may appear on manufactured equipment within service rooms and service spaces. Contractor is responsible for removing all labels and trademarks in such manner that finished surfaces are not damaged and are free of adhesive. The Owner shall backcharge the Contractor for such work where it is not performed prior to application for Substantial Performance or occupancy of portions of the Work by the Owner.
  2. Exception to this requirement is any trademark or label which is essential to obtain identification of mechanical and electrical equipment or devices for maintenance purposes, government ratings, CSA or other government approvals.
  3. Permanent labels, trademarks and nameplates on products are not acceptable, except where required for operating instructions, or when located in mechanical or electrical rooms.
7. Fastenings and Accessories
  1. Design and provide all fastenings and accessories required for the installation of Products, whether specifically identified on drawings and specifications or not. All fastenings and accessories reasonably inferable as required for a complete, finished, functional installation are included in the requirements of the Work and the Contract Price.
  2. Supply appropriate fastenings to prevent electrolytic action between dissimilar materials.
  3. Use non-corrosive hot-dip galvanized steel fastenings and anchors for securing exterior work, unless stainless steel or other material is specifically requested in the Documents.
  4. Design fastening, anchorage and support systems to withstand forces and service conditions noted in Section 002000. Design fastenings and adjustable systems to ensure that fastening

withstands repeated reversals of loads and other oscillations associated with service conditions without damage to fastenings or materials fastened.

5. Friction fastening, pressure fit connections, or other connections which do not have threaded and tapped fastening through full depth of joined materials are not acceptable for fastening of major Product components.
  6. Do not use powder-actuated fastenings.
  7. All screw fastenings exposed in the finished Work shall be Robertson wherever the type of fastener is available in Robertson head.
  8. Supply fastenings in quantities and quality to space anchors within their load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.
  9. Keep exposed fastenings and onsite installed fastenings to a minimum, for even spacing. Shop install neatly where ever possible.
  10. Fastenings causing spalling or cracking of material to which anchorage is made are not acceptable. Supply of all anchorage fastenings shall be accompanied by specific manufacturer instructions for minimum depths and clearances within substrates to avoid spalling or failure.
8. Substitutions or Alternatives
1. Product alternatives will be considered by the Owner prior to the award of the Contract only in the form prescribed by the Bid Documents. Upon award of Contract, supply Products and items of work as specified and required for the completeness of the Work and to the requirements of the Contract Documents. No substitutions are permitted without prior written acceptance by Owner.
  2. Proposals for substitution of Contract requirements may be submitted after award of the Contract. Such requests must include statements of respective costs of items originally specified and the proposed substitution. All requests for substitution shall be reviewed by the Consultant as an additional service to its Contract with the Owner, and such costs shall be deducted from the Contract Price in reimbursement of the Owner's additional cost.
  3. Proposals will be considered by Consultant if:
    1. the Product selected by Contractor from those specified is not available;
    2. delivery date of the Product selected from those specified would unduly delay completion of the Contract; or
    3. an alternative Product to that specified, brought to the attention of and considered by Consultant as equivalent to Product specified, will result in a credit to the Contract Price.
  4. Should proposed substitution be accepted either in part or in whole, assume full responsibility and costs when substitution affects other portions of the Work. Pay for design or drawing changes required as result of substitution.
  5. Amounts of all credits arising from approval of substitutions will be determined by Consultant and Contract Price will be reduced accordingly after acceptance by the Owner.

**END OF SECTION**

## 1. GENERAL

### 1. Related Sections

1. Contractor is to thoroughly review all sections and divisions of the specification, and the drawings, to ensure that work of this section is understood together with all related items of the Contract.
2. Particular attention is drawn to the following:
  1. Form of Agreement and General Conditions as modified by the Supplementary Conditions
  2. All sections of Division 01
  3. Existing Conditions Data and Reference Documents
  4. Section 018010 Commissioning and Performance Verification
  5. Section 019010 Building Systems Requirements

### 2. Definitions:

1. *Install* is hereby defined for the purposes of this Contract as “do all things and perform all activities, excluding only the supply of Products, that are necessary to complete the Work in accordance with the Agreement, General Conditions as modified by the Supplementary Conditions, Co-ordination, Schedule, Existing Conditions, and Execution requirements of the Contract. The term *install* shall be deemed inclusive of all applicable costs for conforming to requirements of Division 01 (except Section 016010, whose costs shall be included in the cost of supply), protection, storage onsite, labour, tools, construction machinery and plant, erection, fastening, placement, fees for royalties or patent rights for processes, insurance, all overhead on such items, all duties, and all taxes excepting only the Harmonized Sales Tax.” The term *install* shall be read to mean in all cases “install by the Contractor as part of the Work” unless the context specifically states that the Owner or Consultant or authority having jurisdiction shall install.
2. *Supply* is as defined in Section 016010 Basic Product Requirements.
3. *Provide* is defined in accordance with the Definitions of the Contract as “to supply and install.” The term *provide* shall be read to mean in all cases “provide by the Contractor as part of the Work” unless specifically stated that the Owner or Consultant or authority having jurisdiction shall provide.
4. For definitions of *Tolerance*, *Plumb*, *Level*, *Square*, and *Straight* see Quality Control provisions as described elsewhere in Division 01.

### 3. General

1. Install Products in accordance with the procedures for scheduling the Work as described elsewhere in Division 01. Install Products in a timely manner so as not to impede the progress of the Work.
2. Install Products in accordance with reviewed and accepted Submittals as described elsewhere in Division 01. Install Products as identified on reviewed and accepted Submittals.
3. Install Products and perform all work in accordance with Special Project Requirements as described elsewhere in Division 01.
4. Install Products in accordance with requirements for co-ordination of the Work as described elsewhere in Division 01.
5. Install Products in accordance with requirements for temporary facilities and safety as described elsewhere in Division 01.

### 4. Examination

1. Prior to submitting a tender for the performance of the Work, examine the Contract Documents, the existing conditions, the reference documents, the site, the Owner’s property, access routes both public and private, and surrounding areas.

2. Be fully informed as to the conditions and limitations under which the Work is to be executed. Perform requirements of Section 019010 prior to beginning installation of materials and products. Provide detailed design of items as required to provide all aspects of building systems to exceed the performance requirements of the systems and to achieve their design intent. Claims for additional costs will not be entertained with respect to conditions or limitations that can reasonably be inferred by examination or that are required to provide complete and functional building systems.
  3. Contractor shall require Subcontractors to perform the examination for all aspects of conditions that may affect their respective portions of the Work.
  4. Promptly notify the Consultant of any conditions during the course of the performance of the Work that in the Contractor's opinion are at significant variance with conditions at time of tendering. Consultant shall determine the Contract requirements and any changes thereto.
5. Contractor's Use of Site and Place of the Work
1. Contractor's Use of Site and Place of the Work shall be in strict accordance with Owner's requirements for access and other existing conditions noted in Section 002000, Section 013020, drawing sheet A004 showing required sequences of construction, for Owner access and use of the existing property and facility, and are irrevocably incorporated into the Contract as per Contractor's completed bid form and the executed agreement. Contractor shall co-ordinate the execution of the Work, including noise and other forms of pollution, for minimal interference with neighbours use and enjoyment of the property of the site and property. Pay all costs and comply with Owner's instructions for pollution abatement, including noise abatement when requested or required by governing authorities and regulations.
  2. Do not unreasonably encumber the site with Products, materials, or equipment. Co-ordinate supply for a timely installation in accordance with the schedule.
  3. Move stored Products or equipment that interferes with operations of Owner, Consultant, or Other Contractors at no cost to the Owner, Consultant, or Other Contractors.
  4. Obtain and pay for additional storage or work areas needed for operations as required.
  5. Undertake all precautions to prevent vandalism or damage, especially which might delay the progress of the Work, to Products, to the installed portions of the Work, and to the site generally. Conform to the Owner's security requirements.
  6. Accept full responsibility for assigned work areas and site from the time of Contract award until handover of the completed Work to the Owner.
6. Mockups
1. Where required by the Contract Documents, requested by Consultant, or recommended by Product Suppliers, construct mockups of installations onsite, in size and location as directed by Consultant.
  2. Construct mockups prior to start of affected work. Allow sufficient time for review and acceptance of procedures by all concerned, including Product Suppliers, prior to scheduling main installation work for items and systems mocked up.
  3. For all Building Systems, the nominated entity responsible for the installation of the Building System shall review and make recommendation as to the need for mockups of aspects of the System installation. Report such recommendations in writing to the Owner and Consultant, and arrange for the installation of mockups as directed.
  4. Make revisions or re-erections of mockups until mockup, including installation sequences, is acceptable to Consultant and all Product Suppliers.
  5. Mockups shall not be incorporated into finished Work, unless with specific permission from the Consultant.

7. Concealment

1. Conceal piping, conduit, wiring and other portions of Building System distribution that is located in or near finished areas.
2. If any doubt arises as to means of concealment, or intent of the Contract Documents in this connection, request clarification from Consultant before proceeding with portion of work in question.

8. Dimensions and Levels

1. Check and verify dimensions and levels wherever referring to work. Inform Consultant immediately of any errors or discrepancies found. Dimensions, where pertaining to work described elsewhere or described by submittals or manufacturer's instructions, shall be verified with all Subcontractors and Suppliers concerned. Assume full responsibility for dimensions and layout. Subcontractors may not lay out work without review and approval of such layout by the Contractor.
2. Do not scale drawings. If there is any ambiguity, lack of information or inconsistency, immediately inform the Consultant and follow the Consultant's instructions.
3. Critical dimensions may be indicated by use of the word "HOLD" on drawings. Give these dimensions priority.
4. Where dimensions are accompanied by the words "Job Check", such dimensions shall be field verified and communicated to all trades concerned. Where field measurement differs significantly from dimension shown, inform Consultant and obtain clarification of requirements.
5. Where dimensions are shown with calculations (for example, "12 bricks + 13 joints, 8' 0 1/4") verify supplied Product sizes with accepted submittals and Suppliers, and inform all trades that may be affected by the dimension. Inform Consultant of any discrepancy.
6. Where graphic indications on drawings show consistent relations amongst parts of the work, and upon lay out according to dimensions these relationships appear significantly different, inform Consultant immediately and prior to commencing work upon which the dimensioning depends. Follow Consultant's instructions for layout.
7. Lay out curves using radii. Where radii are overly large for such layout, inform Consultant and Consultant will provide computerised data as a cross-check for layout.
8. The Contractor and all trades shall employ the same system of measurement as the drawings, either metric or imperial as the case may be. Under no circumstances shall dimensions be converted during the laying out of any portion of the work.
9. Install all components of the Work plumb, true, square, and level unless specifically noted otherwise.

9. Location of Fixtures and Devices

1. Location of fixtures, apparatus, equipment, fitting, outlets, devices, pipes, conduits, ducts and other portions of Building Systems shown or specified but not dimensioned shall be considered approximate. Contractor shall prepare interference drawings where any doubt may occur, as described elsewhere in Division 01.
2. Request direction from Consultant to establish exact locations. Any relocation caused by Contractor's failure to request direction from Consultant, including repairs and replacement of affected work adjacent, shall be done by the Contractor at no added expense to the Owner. Where job conditions require reasonable changes in indicated locations and arrangements, make changes at no cost to Owner.

3. Conserve space and co-ordinate the Work as described elsewhere in Division 01 so as to ensure that ducts, pipes, conduits, portions of Building Systems and other items will fit into allocated wall and ceiling spaces, while ensuring adequate space for access and maintenance. Be especially mindful of requirements for clearance for hinged access covers.
4. Where piping, conduits, or other portions of Building Systems are permitted to be exposed they shall be neatly and uniformly laid out parallel to adjacent building lines and parallel to each other where the run in the same general direction. Review exposed installations with Consultant prior to start of work. At no cost to Owner make changes to exposed work as directed by the Consultant.
5. Except where specifically noted on drawings for individual items, install exposed devices, fixtures, and other items including outlets, switches, sensors, thermostats, panels, grilles, and other items in an orderly and neat manner, lining up with each other and grouped together where possible. Review installation with Consultant prior to start of rough-in work. Relocate at no cost to Owner any work that does not meet this requirement.
6. Review location of devices for potential interference of door swings, furnishings placement, or other interferences likely to occur in the occupied and furnished Work. Bring any concerns to the attention of the Consultant prior to rough-in and follow instructions for relocation if required at no cost to Owner.
7. Owner reserves the right, prior to rough-in, to relocate any device or item over a distance of not more than 5'-0" (1525mm) from its indicated or dimensioned position on the drawings, at no change in Contract Time or Contract Price.

## 2. QUALITY OF WORK AND INSTALLATION

### 1. Manufacturer's Instructions

1. All Products shall be supplied with written manufacturers' instructions for care, handling, transportation, and installation suitable for the specific purposes, building system design intent, and conditions of the Work. Maintain copies of these instructions onsite, available for review by the Owner and Consultant. Products shall be supplied ready to meet the performance requirements of the system of which it forms a whole or part, without onsite alteration that could more reasonably have been performed by the supplier or in a manufacturing setting.
2. Notify the Consultant in writing, of conflicts between the Contract requirements and manufacturer's instructions, so Consultant may establish the course of action.
3. Improper installation or erection of supplier's products due to failure in complying with these requirements authorizes the Consultant to require removal, and reinstallation of new products at no increase in Contract Price.
4. Where specific requirements of the Contract Documents are in conflict with manufacturer's written instructions, follow the more stringent requirements and inform Consultant. All costs for this requirement are deemed included in the Contract Price and Contract Time.

### 2. Workmanship

1. Workmanship shall be the best quality, executed by supervisors, journeymen, mechanics, and labour experienced and skilled in the respective duties for which they are employed. Immediately notify the Consultant if required work is such as to make it impractical to produce required results.
2. Unless otherwise specified in a more detailed manner, workmanship is to be of the highest quality recognised by the trade executing the work in accordance with best standards of practice, by the best methods recommended by the manufacturer of the Product and as accepted by the Consultant.
3. In no case proceed in uncertainty with regard to workmanship standards required for the Work or any of its aspects. Performance of Work or any of its aspects is acknowledgement that the

Contractor and all personnel performing work are fully cognisant of best means and methods for such work or aspect of the Work, and are proceeding by implementing these means and methods. Remove and replace any portions of the Work not so performed, as directed by the Consultant, and replace all products and items of the Work to meet required standards of workmanship at no cost to the Owner.

4. Decisions as to the quality or fitness of workmanship in cases of dispute rest with the Consultant, whose instructions shall be promptly executed.
5. Do not employ any unfit person or anyone unskilled in their required duties. Comply with Owner's requirements for operation, safety, and other procedures as referenced in Section 002000 and Special Project Requirements for Behaviour, Decorum and Workplace Culture as set out in Section 011020. Enforce no smoking policies, and ensure that personnel are respectful of the operational and security requirements, staff, and the public. The Consultant reserves the right to require the dismissal from the Place of the Work and the Work of workers deemed incompetent, careless, insubordinate, failing to abide by the Core Values of the required workplace culture, or otherwise objectionable behaviour.

### **3. INSTALLATION OF FASTENINGS, INSERTS, AND ACCESSORIES**

#### **1. General**

1. Design and provide all fastenings and accessories required for the installation of Products, whether specifically identified on drawings and specifications or not. All fastenings and accessories reasonably inferable as required for a complete, finished, functional installation are included in the requirements of the Work and the Contract Price.
2. Do not use powder-actuated fastenings or fasteners stressed in withdrawal.
3. All screw fastenings exposed in the finished Work shall be Robertson wherever such type of fastener is available in Robertson head.
4. Supply fastenings in quantities and quality to space anchors within their load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable. Do not use wood fastenings for metal connections, and use wood fastenings appropriate to type of wood products being connected.
5. Install fastenings appropriately, to prevent electrolytic action in dissimilar metals or materials.
6. Use non-corrosive hot dip galvanized steel fastenings and anchors for securing exterior work, unless stainless steel or other material is specifically requested in the affected specification section.
7. Where fasteners may need adjustment, torque readings, maintenance, or are to be removed during in-service maintenance of the completed Work, locate these fasteners so that fasteners are accessible with tools for easy removal and replacement.
8. Countersink fasteners and conceal wherever possible.
9. Supply and install all inserts required for fasteners. Ensure compatibility of insert by using same manufacturer or checking with fastener manufacturer regarding acceptability.
10. All fastening of pre-finished material shall use concealed methods. No cup washers or surface nailing will be allowed under any circumstances.

#### **2. Design and Installation of Connections**

1. Design fastening, anchorage and support systems to withstand forces and service conditions noted in Section 002000 and in the Ontario Building Code for 25 year storm events. Design fastenings and

adjustable systems to ensure that fastening withstands repeated reversals of loads and other oscillations associated with service conditions without damage to fastenings or materials fastened.

2. Friction fastening, pressure fit connections, or other connections which do not have threaded and tapped fastening through full depth of joined materials are not acceptable for fastening of major Product components.
3. Installation of fastenings which cause spalling or cracking of material is not acceptable. Locating fastenings near edges of materials where strength of fastened materials is insufficient to withstand design stresses during the service life of the completed Work is not acceptable.
4. Design and execute fastening work using principles of redundancy and "fail-safe" methods. Under no circumstances shall items be connected with a single fastener only.
5. Submit samples of fasteners and all fastening designs not explicitly detailed in the Drawings or described in the specification for review and acceptance as described elsewhere in Division 01, prior to installation. Designs of connections and fastening for all components governed by the design of an Engineer shall be designed by an Engineer licensed to practice at the place of the Work and registered with the Province of Ontario to provide building code certification for the applicable discipline of design. Pay all costs for such design as part of the Work.

#### **4. INSTALLATION REQUIREMENTS FOR ANTICIPATED SERVICE LIFE**

##### **1. Movement and Tolerance**

1. All Products shall be installed in strict accordance with written Product Suppliers' or manufacturers' instructions for best in-service performance for the specific location and potential in-service conditions that are reasonably inferable from the design and intent of the Building System of which it forms the whole or a part. Provide control joints, expansion joints, laps, fastening designs and executions, and erection procedures and sequences that will permit expansion and contraction or other forms of in service movement in the installed Product or material. The finished Work shall be capable of such in-service movement without causing distortion; failure of seals, joints, or integrity of Building System; undue stress; cracking; bowing; or other defects detrimental to appearance, longevity, performance of the Product of Building System of which it is a part.
2. Erect and install Products with due regard for sequencing of dead loads and live loads that will be imposed upon the installation during subsequent construction and during the in-service life of the component in the Facility.

##### **2. Design of Separations, Control of Drainage, Control of Pressure, Redundancies**

1. Ensure that Products are installed for best performance in service conditions where adjacent Products may have failed. Use principles of redundancy, overlap, fastening, good drainage, and organise lapping of materials to shed moisture rather than trapping it.

##### **3. Submissions**

1. Submit samples, sketches, designs, or applicable trade and manufacturers' literature showing intended design for tolerances, movement, separations, control and redundancy for review and acceptance to procedures as described elsewhere in Division 01, prior to installation. Designs that include components governed by the design of a professional shall be designed by a professional licensed to practice at the Place of the Work and registered with the Province of Ontario to provide design for the applicable discipline. Pay all costs for such design as part of the Work, and provide proof of professional liability insurance against errors and omissions as part of the first submission.

**END OF SECTION**

## 1. GENERAL

### 1. Related Sections

1. Contractor is to thoroughly review all sections and divisions of the specification, and the drawings, to ensure that work of this section is understood together with all related items of the Contract.
2. Particular attention is drawn to the following:
  1. Form of Agreement and General Conditions as modified by the Supplementary Conditions
  2. All sections of Division 01, especially sustainable environmental commissioning and cleaning requirements
  3. Special Project Requirements Section 011020.
  4. Cleaning requirements set out in particular sections of the Specification for aspects of the Work

### 2. General Requirements

1. Conduct cleaning and disposal operations to comply with local ordinances and applicable laws.
2. Store volatile waste in covered metal containers, and remove from site at end of each working day.
3. Prevent accumulation of other waste by removing such waste at appropriate intervals from the site, not to exceed weekly.
4. Provide adequate ventilation during use of volatile or noxious cleaning substances.
5. Use only cleaning materials recommended by both manufacturer of surface to be cleaned and by cleaning material manufacturer. Make good damage to finishes at no expense to Owner.
6. In the event of any dispute regarding the removal of waste products, debris, tools, equipment, etc. The owner may remove the waste product and debris and charge the cost to the contractor, by means of deduction from monies owing the contractor, to the extent that the consultant shall determine to be just.
7. Clear sidewalks of snow and ice adjacent to the construction site where they abut areas under the contractor's control.

### 3. Cleaning during Progress of the Work

1. Maintain the work in tidy condition, free from accumulation of waste products and debris, other than that caused by the owner or other contractors. Clean areas where work is being performed on a daily basis.
2. Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
3. Remove waste material and debris from the site and deposit in waste container at the end of each working day.
4. Clean work area(s) upon completion of each day's work, and maintain areas free of dust and other contaminants during finishing operations. On a daily basis maintain project site and public properties free from debris and waste material.
5. Provide for garbage chutes, on-site debris collection and disposal equipment, and services needed to dispose of all debris. Do not use owner's waste containers for disposal of debris arising from work of this contract. Provide and pay for dedicated waste disposal for work of this Contract.
6. Remove waste materials and rubbish from site and dispose of at legal dumping areas. Pay all disposal costs.

7. Clean interior areas prior to finish work, furniture move-in and final clean prior to occupancy, maintain areas free of dust and other contaminants during finishing operations.
  8. Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer, and as compatible with owner's cleaning systems for existing surfaces.
  9. Vacuum clean with commercial type vacuum interior building areas when ready to receive flooring and finish painting. Continue vacuum cleaning on an as-needed basis until work is complete.
  10. Vacuum clean interior surfaces and areas when ready to receive painting and finishes. Continue vacuum cleaning until such areas are ready for substantial completion or occupancy, whichever occurs later.
  11. Schedule cleaning operations so that resulting dust and other contaminants will not fall on wet, newly painted surfaces.
  12. Schedule cleaning operations so that dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems whether existing or new.
  13. On a daily basis clean all areas dirtied by work of this contract to suit the owner's continuing use and occupancy during construction.
  14. Where walks and roads are soiled by work of this contract: At a minimum, weekly sweep and wash owner's roads and walks soiled by work of this contract. Sweep and wash roads and walks more frequently where soiling may be tracked into adjacent buildings. Sweep and wash public roads and walks weekly, at a minimum, and more frequently as required by Owner or local municipality.
  15. Maintain the site, including adjacent private and public property, so as to keep such areas free from accumulations of waste material and debris.
  16. Provide on-site containers for waste and recycling materials, to location(s) approved by owner.
  17. Recycle all excess and waste material at depots designated by municipal or regional authorities, and as outlined elsewhere in Division 01 for sustainable environmental objectives. Pay all fees.
  18. Maintain and clean erosion and sedimentation control measures as an integral part of construction Cleaning activities, and in accordance with Details on Drawings.
4. Cleaning of Areas in Existing Facility
    1. Where the work of this contract involves work within the existing Facility, such areas must be immediately cleaned to final clean standards, to the satisfaction of the Owner. It is not the intent of this requirement that cleaning of the entire Facility be required, only to those specific areas affected by the Work.
5. Cleaning of Existing Air Distribution Systems
    1. Working in conjunction with the Mechanical Trade Contractor, prior to start-up, verification and commissioning activities, and flush-out, clean all existing air distribution ductwork systems, including but not necessarily limited to, supply, return, make-up, exhausts. Provide all removals and re-installations as may be required to accomplish the Work. Provide all temporary protection measures as may be required.
6. Final Cleaning
    1. Where work is sequenced or phased, and upon completion of work in each floor, or part of each floor area, clean rooms or spaces affected by work of this contract.
    2. When the Work is substantially performed, remove surplus products, tools, construction machinery and equipment not required for the performance of the remaining work.

3. Remove waste products and debris other than that caused by the owner, other contractors or their employees, and leave the work clean and suitable for the occupancy by owner.
4. When the work is complete, remove surplus products, tools, and Construction Equipment. Remove waste products and debris other than that caused by the Owner or Other Contractors.
5. Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, mechanical and electrical fixtures. Replace broken, scratched or disfigured glass. Leave existing items in better condition than as encountered at the start of the work.
6. Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, and floors and ceilings.
7. Vacuum clean and dust building interiors, behind grilles, louvers and screens. Thoroughly vacuum clean interior of all electrical and mechanical equipment and wet mop hard floors to remove all dust.
8. Wax or finish, seal, and prepare floor finishes, as recommended by the manufacturer and after consultation with the owner's maintenance staff. Finish floors with 2 coats of recommended finish.
9. Where work of this contract damages sheet or tile floor finishes after their installation, repair floor, then clean seal and finish floor, as recommended by the floor and cleaner manufacturer.
10. Inspect finishes, fitments and equipment and ensure specified workmanship and operation. Correct deficiencies.
11. Broom clean and wash exterior walks, steps and surfaces. Sweep and wash clean site paved areas.
12. Remove dirt and other disfiguration from exterior surfaces.
13. Clean and sweep roofs, gutters, downspouts, and drainage systems, areaways, sunken wells.
14. Clean equipment and plumbing fixtures and HVAC components, including ductwork, to a sanitary condition. Clean or replace equipment filters at the direction of the Consultant.
15. Clean exterior wash-down area for vehicles and equipment, to "as existing" and clean condition. Remove any accumulations of concrete or other materials in wash-down areas immediately upon completion of wash-down activities.

**END OF SECTION**

## 1. GENERAL

### 1. Related Sections

1. Contractor is to thoroughly review all sections and divisions of the specification, and the drawings, to ensure that work of this section is understood together with all related items of the Contract.
2. Particular attention is drawn to the following:
  1. Form of Agreement and General Conditions as modified by the Supplementary Conditions
  2. All sections of Division 01

### 2. Definitions

1. *Solid Waste*: Any waste material (including land-clearing debris) that is sent from the Project Site to another location for disposal.
2. *Land-Clearing Debris*: Waste materials resulting from land-clearing that include pre-existing development materials and plant matter, but do not include soil.
3. *Reused Waste*: Waste materials that are sent to a location off-site (e.g. another construction project or product supplier) where they are used in their original form (i.e. without additional processing).
4. *Recycled Waste*: Waste materials that are sent off-site to a recycling facility where they are used to displace virgin materials as feedstock for manufacturing processes that create new products.
5. *Landfill Waste*: Waste materials that are sent to a landfill site for disposal.

### 3. References

1. Ontario. Environmental Protection Act. Ontario Regulation 102/94: Waste Audits and Waste Reduction Workplans.
2. Ontario. Ministry of the Environment (MOE). A Guide to Waste Audits and Reduction Workplans for Construction and Demolition Projects as Required Under Ontario Regulation 102/94.
3. Ontario. Environmental Protection Act. Ontario Regulation 103/94: Industrial, Commercial and Institutional Source Separation Programs.
4. Ontario. Ministry of the Environment (MOE). A Guide to Source Separation of Recyclable Materials for Industrial, Commercial and Institutional Sectors and Multi-Unit Residential Buildings as Required Under Ontario Regulation 103/94.
5. Canadian Construction Association. Standard Construction Document CCA 27-1997: A Guide on Construction Environmental Management Planning.
6. Canadian Construction Association. Standard Construction Document CCA 81-2001: A Best Practices Guide to Solid Waste Reduction.
7. Canada. Public Works and Government Services Canada. 2002 National Construction Renovation and Demolition Non-Hazardous Solid Waste Management Protocol.
8. CaGBC. "Materials & Resources Credit 2: Construction Waste Management". Leadership in Energy and Environmental Design Reference Guide for New Construction & Major Renovations (LEED Canada-NC Version 4).

4. Intent

1. Minimize the amount of solid waste (including land-clearing debris) generated by construction, renovation and demolition (CRD) activities.
2. Of the inevitable solid waste (including land-clearing debris) that is generated by CRD activities, divert more than 75% from landfill through reuse and recycling.
3. Comply with all applicable Environmental Protection Act of Ontario regulations relating to construction waste management including Ontario Regulation 102/94 and Ontario Regulation 103/94.
4. Comply with Canadian Construction Association's "Code of Practice" outlined in Standard Construction Document CCA 27-1997 to encourage improved waste management practices.

5. Description

1. The site superintendent (or other person designated by the Contractor and acceptable to the Owner and Consultant) shall be responsible for all aspects Waste Management and Disposal.
2. Identify, implement and document measures to achieve the waste management objectives listed above.
3. Follow a strategy based on the 3R's hierarchy: Reduce the generation of waste materials at the project site, Reuse waste materials on other construction sites (when feasible) and Recycle waste materials as feedstock for manufacturing processes that create new products.
4. Waste Management and Disposal activities shall include:
  1. Arranging waste management service agreements with waste haulers and waste receiving facilities.
  2. Supervising on-site waste management activities on a daily basis.
  3. Coordinating waste management tasks with subcontractors to ensure timely and orderly progress of the work.
  4. Preparing waste management documentation and submittals to summarise all shipments of waste materials from the project site.
  5. Reporting waste management progress to the Consultant.

6. Submittals

1. Construction Waste Management Plan for review and acceptance by the Consultant.
2. Documentation from each receiving facility to corroborate how waste was / or will be recycled/salvaged.
3. Waybills, invoices, letters and other documentation clearly indicating receiving facility, end use (reused, recycled, or landfill) and quantity of waste for each shipment of waste generated on site.

**2. MATERIALS, NOT USED**

**3. EXECUTION**

1. Waste Reduction

1. Encourage suppliers and subcontractors to retrieve/retain packaging (e.g. skids, plastic wrap, etc.) for reuse.

2. Suppliers and sub-contractors must provide Contractor with re-use policies, so that recycling can be co-ordinated.
3. Prevent damage of materials due to mishandling, improper storage, and contamination.
4. Where possible, use prefabricated assemblies built at a central facility to avoid waste generation at the site.

## 2. Waste Diversion

1. Contact local salvaging/recycling facilities and arrange for recycling/reuse services. At a minimum, the proposed facilities must recycle/reuse the following waste materials that will be generated throughout construction:
  1. Land clearing debris
  2. Asphalt
  3. Concrete / masonry / stone
  4. Steel and other metals
  5. Wood (see note below)
  6. Cardboard
  7. Plastic
  8. "Blue Box" waste
2. Use of material as landfill cover is not considered as recycling or reuse.
3. Incineration of wood waste for power generation is not considered as recycling or reuse.
4. Recommended measures for recycling/reusing wood include encouraging suppliers to reuse wood pallets, sending wood pallets to pallet recycling companies and converting waste wood into landscaping mulch.
5. Designate a central Waste Collection Area onsite that is dedicated to the separation and storage of all waste generated during construction.
6. Provide containers in the Waste Collection Area that are sized to accommodate the separation and storage of expected waste types and quantities. Provide separate containers for each of the following material types:
  1. Land clearing debris
  2. Asphalt
  3. Concrete / masonry / stone
  4. Steel and other metals
  5. Wood
  6. Cardboard
  7. Plastic
  8. "Blue Box" waste (as per 10)
  9. Mixed waste
  10. Other types (as required by salvaging/ recycling facilities)
7. Clearly indicate the material type being stored in each container using appropriate signage.
8. All subcontractors shall use the containers provided in Waste Collection Area, or shall report to the superintendent the method of salvage, re-use or recycling used for material removed from site.
9. Follow the salvaging/recycling facilities' material acceptance requirements to ensure materials are properly sorted, grouped, and packaged for collection.
10. Provide "Blue Box" recycling bins near the construction trailer for recycling waste generated by site workers and visitors. Waste deposited in these bins shall include the following, or adhere to

the local recycling program:

1. Aluminium food or beverage cans
  2. Glass bottles and jars for food or beverage
  3. PET bottles for food or beverages
  4. Steel food or beverage cans
  5. Cardboard and paper products
3. Waste Tracking
1. Coordinate delivery of separated materials to accepted salvage or recycling facilities.
4. Inspections and Maintenance
1. Conduct daily inspections of containers to check for and remedy cross-contamination.
  2. Promptly transport containers to receiving facilities when containers are full.
  3. Ensure the material type is clearly labelled on each container.

**END OF SECTION**

## 1. GENERAL

### 1. Related Sections

1. Contractor shall thoroughly review all sections and divisions of the specification, and the drawings, to ensure that work of this section is understood together with all related items of the Contract.
2. Particular attention is drawn to the following:
  1. Form of Agreement and General Conditions as modified by the Supplementary Conditions
  2. All sections of Division 01, especially requirements for Maintenance Manuals and Commissioning Reports.
  3. OGCA Document 100 - Take Over Procedures, as issued by the Ontario General Contractors' Association.
  4. Further requirements for procedures and services required prior to Substantial Performance of the Work, as set out elsewhere in the specification and/or drawings and schedules.

### 2. Definitions

1. *Deficiency* shall mean a contract requirement that is not yet performed and is required to be performed by the Work. This includes items present onsite but not yet put into operating condition. This includes items from both construction and related service requirements in the Work.
2. *Defect* shall mean a contract requirement that has not been performed to the standard required by the Contract, and is required to be re-performed, removed, or replaced. Refer to GC 2.4. In the alternative, and in accordance with GC2.3, the Owner may decide to deduct the difference in value of the item as performed (versus as required) from the Contract Amount.
3. *Warranty Item* shall mean a defect or deficiency to a contract requirement that has been installed and accepted and for which the Contractor, Subcontractor, Supplier and/ or manufacturer of the Product agree to maintain in, or restore to perfect condition for a specified period of time under the terms and Conditions of a warranty described in GC 12.3 as amended by the Supplementary Conditions.
4. *Ready for Use* shall mean that the whole of an intended improvement contemplated by the Contract is at the full service and disposal of the Owner in clean and operational condition for complete occupancy and/or use without any interference from the Contractor's operations that are required to finish the Work. The Consultant is under no obligation to certify any portion of the Work as Substantially Performed where other portions remain uncompleted.

### 3. Responsibility for Inspection and Compliance with the Contract

1. Neither the Owner nor the Consultant are responsible for the issuance of extensive lists of defects or deficiencies. In accordance with GC 3.1 as amended by the Supplementary Conditions, the Contractor shall effectively direct and supervise the Work so as to ensure conformity with the Contract Documents.
2. The Contractor shall inspect the Work to ensure such compliance. The Contractor shall require such inspection from all Subcontractors and, where identified in the Contract, from Suppliers.
3. Every effort shall be made by the Contractor to ensure that both defects and deficiencies are made good prior to an application for Substantial Performance. Any review to determine Substantial Performance will immediately be cancelled if it becomes obvious that any other than minor amounts of defects and/or deficiencies are outstanding.

4. Submit required documentation such as statutory declarations, Workplace Insurance Certificates, warranties, certificates of approval or acceptance from regulating bodies at application for Substantial Performance of the Work, and remaining outstanding items at application for final payment.
4. General Requirements for Contract Close-out
  1. Comply with requirements of GC 5.4 Substantial Performance of the Work.
  2. Comply with OGCA Document 100 - Take-over Procedures, in its latest edition.
  3. The Contractor is specifically cautioned that the definition of Substantial Performance of the Work includes that the improvement under the Contract be ready for use, as defined above.
5. Partial Occupancy of Work not yet Substantially Performed
  1. The Owner may elect to occupy the construction during a period after the agreed date for Substantial Performance as required by the terms of the Contract, but before actual attainment of Substantial Performance. Such occupancy shall not be deemed proof that the improvement is ready for use, nor shall Owner's occupancy mean acceptance of all or any item of the Work.
  2. When partial occupancy of the uncompleted construction is required by the Owner as noted above, the Contractor shall co-ordinate Owner's use, requirements, access, and enjoyment with requirements to complete the Work. Perform all work and pay all costs for temporary protection and measures required to facilitate Owner's occupancy with minimal disruption to Owner's enjoyment.
  3. Co-ordinate and schedule Contractor's and Subcontractor's cleaning-up and completion activities (including out-of-hours work if necessary) with Owner's moving-in of staff, furnishings, equipment, building accessibility, traffic, all to suit Owner's schedule and not disrupt Owner's productivity or enjoyment of the Project Site. Pay all costs for this work.

## **2. REQUIREMENTS FOR SUBSTANTIAL PERFORMANCE OF THE WORK**

1. Review / Takeover Procedures
  1. In accordance with OGCA Document 100, prior to application for certificate of Substantial Performance, carefully inspect the work and ensure it is complete, that major and minor construction deficiencies are remedied and/or corrected and the building is clean and in condition for occupancy. Notify the Consultant, in writing, of satisfactory completion of the Work and request a review. Include a complete list of any defects or deficiencies, taking care to distinguish between the two, and specifically identify proposals for correction or completion of each item.
  2. During the Consultant's review, a further list of deficiencies and defects will be tabulated. Correct same at no expense to the Owner. Defects and deficiencies will be categorized as to whether they must be corrected prior to acceptance of the improvement as ready for use, whether they must be corrected during the period prior to finishing the Work, and their status with respect to warranties.
  3. When the Consultant considers deficiencies and defects have been corrected to the extent required for the improvement to be ready for use, and it appears requirements for Substantial Performance of the Contract have been met, the Consultant shall issue a certificate of Substantial Performance.
  4. The Contractor shall promptly advertise Substantial Performance in an accredited trade newspaper in accordance with the format and requirements of the Construction Act, and shall submit two copies of the newspaper containing such advertisement. Pay all costs for this work.

2. Systems Commissioning

1. Prior to application for Substantial Performance of the Work:

1. All equipment must have completed start-up procedures, be tested (including duration tests), be inspected and accepted by authorities having jurisdiction, and have installation certified as complete by the designated Commissioning representative assigned under Section 018010, as well as Supplier or manufacturer where this is a requirement of the Contract. Provide copies of tests, reports, and inspections with the application.
2. All Building Systems shall be fully functional, balanced, and accepted by authorities having jurisdiction, and certified complete by the entity responsible for performance of the Building System in accordance with its design intent under Section 019010. Provide copies of tests, reports, and inspections with the application.

3. Project Documents

1. Submit documents requested for Project Close-out in accordance with Division 01 requirements, OGCA Document 100 procedures, and requirements as elsewhere indicated in the Contract Documents.
2. Submit draft hard copy of Project Documents for review and acceptance of Consultant and Owner. Revise and resubmit further drafts until such time as Project Documents are accepted.
3. Collect reviewed submittals and assemble documents executed by Subcontractors, suppliers, and manufacturers. Review and ensure correctness and completeness. Bind, organize, and complete documents in accordance with Division 01 requirements and as elsewhere indicated in the Contract Documents.
4. Provide warranties in final draft form, in the form prescribed by the Contract. Standard warranty forms are not acceptable except where explicitly stated in the Contract Documents.
5. Provide a complete list of Subcontractors and Suppliers, commissioning representatives, together with names and contact information for use during the Warranty Period.
6. Provide a complete and chronologically organized chart of warranty expiration dates.
7. Upon acceptance of draft Project Documents and Maintenance Manuals described elsewhere, provide three (3) hard copies of documents and one electronic read-only CD of Documents produced by scanning the completed and accepted hard copy documents to PDF format.

4. Final Cleaning

1. Refer to General Conditions as amended by the Supplementary Conditions. Immediately prior to application for Substantial Performance of the Work perform final cleaning as described elsewhere in the specification.
2. Immediately prior to application for Substantial Performance of the Work, remove surplus products, tools, construction machinery and equipment not required for the performance of the remaining Work.

**3. REQUIREMENTS AFTER SUBSTANTIAL PERFORMANCE OF THE WORK**

1. General

1. After attainment of Substantial Performance of the Work as so certified by the Consultant, expedite completion of all other items required to finish the Work. Perform such work as necessary to complete the work promptly and in co-ordination with Owner's use of the Work.

2. Correct all defects, provide all deficiencies, and comply with all instruction for repairs or remedial measures to ensure that the requirements of the Contract are fully met.
3. There will be no certification for payment between Substantial Performance of the Work and issuance of final certificate for payment.
4. When the Work is complete, inspect the Work to ensure no items remain outstanding, and only then call for Consultant review.
5. Attend at such Consultant's review and take note of any items requiring completion as found by the Consultant. The Consultant will not make exhaustive review. If a significant number of items remain defective or deficient, the Consultant shall abandon the review and any subsequent reviews shall be paid for by the Contractor through deduction by the Owner of the cost of such reviews from outstanding Contract amounts.
6. Immediately upon receipt of Certificate of Substantial Performance, execute transition of Performance and Labour and Materials Payment Bond to warranty period requirements.
7. Immediately upon receipt of Certificate of Substantial Performance, provide warranties in accepted final form, fully executed and notarized.

## 2. The Lien Period

1. The Lien Period commencement, procedure and release of holdback monies will be in accordance with the Construction Act, GC 5.5 as amended by the Supplementary Conditions, and the requirements of this Contract.

## 3. Systems Demonstrations and Training

1. Immediately after attainment of Substantial Performance of the Work, schedule together with Owner demonstration and training of Owner's personnel in the operation and care of each component of Building Systems and each Building System, in accordance with the requirements of Division 01 and as specified elsewhere in the Documents. Contractor's Commissioning Coordinator shall attend at these sessions.

## 4. Cleaning during the Period between Substantial Performance and Completion of the Contract

1. Provide continuous cleaning as an integral part of all work operations during the intervening period between Substantial Performance and Completion of the Contract, so that the completed portions of the Work are maintained to the standard identified and achieved at Substantial Performance. Provide temporary protection to a high standard so that cleaning operations to existing portions of the Work are minimized. Pay all costs for this work.
2. Just prior to Completion of the Contract, remove any minor remaining surplus products, tools, Construction Equipment resulting from finish operations. Remove from site waste products and debris generated from remaining operations and recycle in accordance with sustainability objectives. Perform final inspection to any portions of the Work affected by contract completion work, and do all things necessary to ensure the finished Work and resulting Facility is clean to standards specified.

## 4. REQUIREMENTS FOR FINAL PAYMENT

1. Submit a final statement certifying that the requirements of the Contract are completed and all defects and deficiencies corrected, except work required by the Contract specifically for the Warranty Period such as thermographic testing, maintenance contracts or inspections, or similar items.
2. Submit a final application for payment giving total adjusted Contract Sum, previous payments certified and made, and monies remaining at time of application for final payment. Provide a breakdown of final change order amounts, status of allowances, and holdback payments.

3. Consultant will issue a Final Contract Price Change Order reflecting approved adjustments to Contract Sum not previously made.

## **5. REQUIREMENTS FOR WARRANTY PERIOD**

1. Provide all services required by the Contract Documents for Warranty items in accordance with the General Conditions of the Contract as amended by the Supplementary Conditions. Provide these services promptly and diligently, using personnel fully familiar with the Work that has been performed and who have been involved in commissioning procedures.
2. Co-ordinate the services of Suppliers, manufacturers, subcontractors and others for the rectification of warranty items quickly and diligently.
3. Correct Warranty items immediately upon notification.
4. Prior to the expiry of warranty periods, schedule together with the Owner and Consultant an onsite review of systems and items covered by the specific warranty. Arrange for the attendance of Subcontractors and Suppliers where necessary or advisable. Attend the review and take action on identified items promptly.
5. Where the Contractor fails to take action with respect to Warranty items, the Owner may choose, without prejudice to its rights, to effect repairs or corrections as necessary in its sole opinion, and to deduct the cost of such repairs or corrections from any sum owed or held back from the Contractor. No such action shall void a warranty for the aspect of the Work or Facility so repaired by the Owner.

**END OF SECTION**

## 1. GENERAL

### 1. Related Sections

1. Contractor is to thoroughly review all sections and divisions of the specification, and the drawings, to ensure that work of this section is understood together with all related items of the Contract.
2. Particular attention is drawn to the following:
  1. Form of Agreement and General Conditions as modified by the Supplementary Conditions
  2. GC 12.3, as modified by the Supplementary Conditions
  3. All sections of Division 01
  4. Specific warranties described and required in individual section of the specification and on drawings and schedules.

### 2. Warranties

1. Warranties and warranty periods shall be in accordance with GC12.3 as amended by the Supplementary Conditions, and as further specifically described in the Contract Documents.
2. The Contractor shall solicit on behalf of the Owner all Product warranties in excess of one year (Extended Product Warranties), but shall additionally ensure that all Products are covered with manufacturer or supplier warranties for at least a one year term. Extended Product Warranties shall be executed and submitted with the Record Documents. Note that Extended Product Warranties are separate from warranties required in accordance with GC12.3.1 and GC12.3.3.
3. Contractor is cautioned that all warranties covering the supply and installation of several products as an interrelated piece of the construction or forming all or part of a Building System, and all warranties specifically requesting participation of the Contractor and/or Subcontractor, are not warranties covered by GC12.3.6. These warranties are covered by GC 12.3.1 and GC 12.3.3.
4. Warranties shall be submitted through the Contractor by each Subcontractor and each Supplier performing work. Form of warranty and requirements for execution vary with warranty. In general, warranties may be classified as follows:
  1. the Contractor's one year warranty on the Work as per GC12.3.1 and 4.
  2. Subcontractors' one year warranties on aspects of the Work as per GC 12.3.1 and 4.
  3. specifically requested Contractor's, Subcontractors', and Suppliers' warranties for extended periods on aspects of the Work as per GC 12.3.1 and 4 but for such longer periods
  4. standard manufacturers' warranties on Products as offered by Product manufacturers and suppliers, offered to the benefit of the Owner, or Extended Product Warranties.
  5. specifically requested manufacturers' warranties for extended periods on Products in accordance with GC 12.3.6.
  6. specifically requested manufacturers' warranties for extended periods on Products and Installation, as per GC 12.3.1 and 4 but for such longer periods

### 3. Submissions of Warranties

1. Provide warranties in the form prescribed herein, on company letterhead of the originating firm offering warranty, with specific areas for execution by all firms involved in the warranty.
2. Submit draft unsigned warranties for Owner's review with application for Substantial Performance.
3. All warranties shall specifically show the project, Owner, all firms involved, work covered, and period dated from Substantial Performance or acceptance of System or component if later.

## Warranties

4. Warranties shall be executed with original signatures of individuals with authority to bind the firm, with an underlying statement to that effect on the signing line. Warranties shall be duly notarized.
5. Contractor shall provide a completed list of all warranty expiration dates in chronological order for the Owner's use.
4. Terms and Conditions
  1. All warranties submitted to comply with requests for warranties in accordance with GC12.3.1 and 4 shall be without any other terms and conditions, with the exception of a separate attachment regarding proper maintenance and servicing by the Owner. Such attachments must be accompanied with full maintenance and servicing instructions integrally attached to the warranty, or such qualification shall be null and void.
  2. All standard manufacturers and suppliers Product warranties shall be submitted with complete terms and conditions and shall address the specific project noted, on company letterhead, duly executed.
5. Warranties in accordance with GC12.3.1 and 4
  1. Warranties submitted to comply with GC12.3.1 and 4 shall state simply and solely as set out in the sample warranty form bound with this specification.
6. Standard Product Warranties
  1. Submit standard product warranties on manufacturer or supplier letterhead specifically identifying the project and the Product warranted, together with all terms and conditions, and with duly authorized original signatures.
7. Extended Product Warranties
  1. Submit extended product warranties specifically requested by the Contract Documents on manufacturer or supplier letterhead specifically identifying the project and the Product warranted, together with all terms and conditions fully in compliance with Contract Document requirements, and with duly authorized, notarized original signatures.
  2. Extended warranties that are requested to be pro-rated, or to include for warranty of both material and workmanship shall specifically so state.
8. Warranty Expiration Schedule
  1. Submit Warranty Expiration Schedule, for submission in handover documents.
  2. Provide with submission of project manuals prior to Substantial Performance of the Work a complete schedule showing expiration dates for all warranties associated with the Work. Organized such schedule chronologically based on warranty expiration date.
  3. Bind this Schedule into the Project Close-Out Manual.

**END OF SECTION**

# Trade LETTERHEAD

(for warranties under GC 12.3.1 and 4)

## Warranty

84 Frederick St. Renovations  
Region of Waterloo

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

*project*  
*owner*  
*general contractor*  
*spec section reference*  
*building systems affected*

We, *[insert full name of trade]*, hereby warrant the following portion of the Work in accordance with GC 12.3.1 and 4 of the General Conditions of the Contract between the Owner *[insert full name of Owner]* and General Contractor *[insert full name of General Contractor]* for the Contract noted above. We shall correct promptly upon receiving notice from the Owner, and without expense to the Owner, defects or deficiencies in the Work which appear prior to and during the Warranty Period noted herein. We shall promptly correct or pay for damage resulting from corrections made under the requirements of this Warranty.

Portion of the Work covered by this Warranty is:

*[refer to technical sections or divisions of the specifications where warranty is for an aspect of the Work. State clearly the description of work covered]*

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Warranty Period is: *[insert number of years]* years from the date of Substantial Performance of the Work, and expires on *[insert expiry date]*.

*[Or, where portion of Work is accepted after the date of Substantial Performance of the Work]*

Warranty Period is: *[insert number of years]* years from the date of acceptance of the portion of the Work, and expires on *[insert expiry date]*.

[Name and address of General Contractor]

[Name and address of Trade Contractor]

\_\_\_\_\_  
[signature]  
*I have authority to bind the Corporation*

\_\_\_\_\_  
[signature]  
*I have authority to bind the Corporation*

## 1. GENERAL

### 1. Related Sections

1. Contractor is to thoroughly review all sections and divisions of the specification, and the drawings, to ensure that work of this section is understood together with all related items of the Contract.
2. Particular attention is drawn to the following:
  1. Form of Agreement
  2. General Conditions as modified by the Supplementary Conditions
  3. General Requirements of Division 01
  4. Building Systems Requirements as per Section 019010
  5. Individual Specification Sections and drawings for Systems
  6. Attached System Commissioning During the Construction Phase diagram appended following this Section. This process is applicable for each Building System.

### 2. Definitions

1. **Commissioning** shall mean the process and performance of services related to the construction and the Work that are specifically intended to adjust and optimise performance of a *Building System* and/or the relations among several or many *Building Systems* to exceed the quality and performance intent of a *Building System* or set of *Building Systems* required by the *Contract*. *Commissioning* shall be completed prior to hand-over to the Owner of the completed, functioning *Work* or portion of *Work* that is *Ready for Use* in the manner for which it has been intended, as inferable or evident from the *Contract Documents*. *Commissioning* is provided by the Contractor as an integral requirement of this Contract. The Owner, Consultant, and Owner's Third Party Commissioning Consultant shall provide oversight and witness to the commissioning, and instruction and clarification regarding performance verification, but do not perform commissioning or operation of any system.
2. **Start-up** shall mean initial start of a particular component that forms part of a *Building System*. Each component requires *Start up*. *System Commissioning* may not commence until all components have been individually started and all defects and deficiencies identified at the *Start-up* have been rectified.
3. **System Commissioning** shall mean initial start, adjustment, and optimization of a particular individual *Building System* to achieve and verify achievement of the required quality and performance intent for the *Building System*. Each *Building System* requires *System Commissioning*. *Final Commissioning* may not commence until all *Building Systems* have been individually commissioned and all defects and deficiencies identified at the system commissioning have been rectified.

Submissions, rectification of deficiencies or defects, inspecting, balancing, and testing of equipment and systems are all part of the commissioning process that occurs **prior** to Substantial Performance of the Work.

4. **Final Commissioning** shall mean that part of the commissioning process that occurs after achievement of *System Commissioning* for all *Building Systems* that are interrelated to the *Building System* receiving *Final Commissioning*. *Final Commissioning* includes *System Commissioning* of any Building Automation or Monitoring System existing in the *Facility* or present in the *Work*.
5. **Building System Workshop** shall mean the project meeting(s) prior to Submittals as set out herein and in Sections 013010 and 019010.
6. **System Commissioning Workshop** shall mean the project meeting(s) prior to *Start-ups* as set out herein and in Sections 013010 and 019010.

7. ***Owner's Commissioning Consultant*** shall mean a consultant under direct contract to the Owner that shall witness the commissioning process on a sampling basis and report results of such reviews and witnessing to the Owner for the Owner's purposes. The Third Party Commissioning Consultant's function and duties for the Owner shall in no way detract from the responsibility of the Contractor, the Contractor's Commissioning Co-ordinator, each Trade Contractor responsible for a system, and the Trade Contractor's System Commissioner for the commissioning and performance verification.
7. ***Commissioning Co-ordinator*** shall mean the individual in the direct employ of the Contractor and as further set out in Section 019010 Building Systems.
8. ***System Commissioner*** shall mean the individual in the direct employ of the Contractor or Trade Contractor to whom responsibility for system verification and performance has been assigned as further set out in Section 019010 Building Systems and the appended List of Systems.

3. Intent

1. Upon commencement of the Work, for each building system in the Work, and in accordance with Section 019010, the Contractor shall identify an authorized representative of the Contractor acting as a *Commissioning Co-ordinator* on behalf of the Contractor, Subcontractors, and Suppliers responsible for the specific Building Systems forming part of the Work, and a *System Commissioner* for each of the specific Building Systems who shall jointly and severally perform the following duties throughout the term of the Contract and Warranty Period:
  1. Review the Contract Documents & attend pre-installation meetings, and ascertain knowledge of the design intent of the building system and the relation and function of its parts;
  2. Review all submissions under the Contract pertaining to the Building System and require revision and resubmission of such accept such submissions as complying with Contract requirements, and submission of all manufacturer installation checklists and recommended procedures for installation, start up, and commissioning of all equipment, prior to submission of reviewed Submittal to Consultant;
  3. Review the training and level of expertise of the lead hand tradesmen nominated to perform installation work for the system and its parts, and accept their fitness for such work; provide liaison and instruction to those performing installation work, including liaison to Product and material suppliers;
  4. Co-ordinate and direct the preparations for the System Commissioning Workshop for the system in the Work for which he or she is responsible, and be present at component Start-up, System start-up and Commissioning and Final Commissioning and review system performance during initial operation;
  5. Attend the location of installation at a suitable point in the progress of the Work so as to provide instruction to the Contractor, the Subcontractor, and the accepted installation workforce as to the recommended installation of the Product within the system;
  6. Inspect the equipment and system installation and ensure it is installed in accordance with the written recommendations of the manufacturer of equipment and the standards for the system;
  7. Perform all Functional Performance Tests (FPT's) and complete all FPT checklists and forms as provided by equipment and systems component manufacturers or further supplied by the Owner's Third Party Commissioning Consultant;
  8. Begin, maintain, and complete an Issues Log for each system, such that all items identified during the commissioning process for the system and its interrelation to other systems are tracked, resolves in a manner satisfactory to the Owner's Third Party Commissioning Consultant

7. Co-ordinate balancing and adjusting of the system for optimal performance in each seasonal condition, or to agreed year-round parameters;
  8. Provide operation, maintenance, and inspection training to the Owner's staff; and
  9. Provide trouble-shooting and problem diagnosis, and ensure correction of Defects and Warranty Items during the Warranty Period.
2. The Commissioning Co-ordinator and the System Commissioners shall co-operate with the Owner, Consultant and any testing and inspection agencies retained separately by the Owner, and shall be fully qualified for the duties intended. No inspection, review or testing by the Owner or Consultant shall detract from the duties and contract requirements for commissioning and performance verification by the Contractor and the responsible Subcontractors.
  3. The Contractor shall submit a complete list of the System Commissioners for review and acceptance with the first application for payment under the Contract, together with a letter from each that acknowledges acceptance of the duties set out in this Section and Section 019010. The Owner is under no obligation to process any payment under the Contract in the absence of such Submittal and its acceptance by the Consultant.
4. Submittals
    1. Submittal Drawings and Equipment Data - to be submitted by Contractor – refer to Section 013030. The system commissioner for each building system shall inspect submittals to ensure the system components and equipment being supplied conform to the Contract and are consistent with the system performance intent and the required commissioning functional performance test procedures. If not in conformance, the System Commissioner and the Commissioning Co-ordinator shall ensure that the variances are acceptable to the Team, and that commissioning checklists are revised accordingly.
    2. As-Built Record Drawings – refer to Section 018040. The various trades shall mark-'up the consultants' drawings to clearly indicate the approved changes in the design or layout that took place during construction.
    3. Facility Manuals - refer to Section 018050. The Commissioning Co-ordinator shall compile facility manuals as specified in the contract documents using the operating manual and record document material submitted by the System Commissioners for each system.
  5. Costs
    1. All costs for work described in this Section and elsewhere in the specifications as relating to startup, balancing, system commissioning, final commissioning and training are at the Contractor's expense and are included in the Contract Price.

## **2. STARTUP AND COMMISSIONING**

1. Review of Contract Requirements and Submittals
  1. Prior to confirmation of Product orders by the Contractor or any Subcontractor or Supplier for each system, the System Commissioner shall review the Contract Documents and project requirements with the Contractor's Commissioning Co-ordinator and all lead foreperson and superintendent staff. Submit to the Consultant a record of this review.
  2. The System Commissioner shall review and accept at a minimum "reviewed as noted" the submittals for all equipment, Products and systems materials applicable prior to forwarding to the Contractor for review. Failure to diligently review may result in a finding of Defective Work and re-review by the Consultant at Contractor's expense.
2. Building System Workshop Prior to Commencement of Work for a Building System

1. For each Building System in the Work, the Contractor's Commissioning Co-ordinator shall organise and co-ordinate a workshop session with the Consultant and the system designer, and all representatives of manufacturers of equipment in the system, the System Commissioner and all technicians and representatives of all Subcontract and Supplier entities involved in the chain of supply and the installation for components in the system or control of such equipment.
2. The workshop shall be of sufficient duration to thoroughly discuss and explore all aspects of the Building System's design, performance intent, and contract requirements, and to resolve all identified or perceived conflicts among scheduling, supply, installation, commissioning, and performance.
3. The System Commissioner's Inspection of Installation
  1. The System Commissioner shall assist with any adjustment, balancing, levelling, or other procedures in order to ensure proper installation of material and product portions of the System, and shall instruct the Owner's nominee in such techniques during training.
  2. Provide and employ instruments required for testing, adjustment, and flushout operations to portion of systems requiring same prior to startup of equipment pieces, and perform such operations. Ensure that ducting, piping or other portions of system to be later concealed and/or connected to pieces of equipment are tested against failures (pressure, leakage, vibration or other defect) and are properly installed free of defect prior to Contractor or other trades covering such work.
  3. Accurately record data relating to electrical and temperature performance of Product where applicable.
  4. Report to Consultant any deficiencies or defects noted during installation.
  5. Take photographic record of all portions of systems that will be covered in the finished Work, and submit photographs to Consultant each month showing progress of the installation. Provide electronic versions of photographs for use by the Contractor in assembling Record Documents. See Section 018040.
4. Systems Commissioning Workshop
  1. For each Building System present in the Work, the applicable System Commissioner shall, prior to start up of any piece of equipment in a Building System, organise and co-ordinate a System Commissioning Workshop.
  2. The workshop shall be of sufficient duration to thoroughly discuss and explore all aspects of the system as installed to date, all procedures for equipment start-up and commissioning, and to resolve all identified or perceived conflicts among scheduling, supply, installation, commissioning, and performance.
  3. Attendance and participation at the commissioning workshop for each system is mandatory for the Contractor's Commissioning Co-ordinator, the nominated Systems Commissioner for the System, and shall be attended by representatives of the Owner (Owner's personnel, Consultant, system designer, and Owner's Third Party Commissioning Consultant).
5. Start-up of System Components, Equipment, and Sub-Systems
  1. The systems Commissioner for the Building System shall be present during work for start up testing and duration testing to satisfy that each equipment piece in the System is fully functional for the intended use, service conditions, and life expectancy.
  2. Provide advance notification of all proposed start-ups to Consultant and Owner's Third Party Commissioning Consultant. Ensure that all Functional Performance Tests and Checklists for installation and initial startup are available for use at start-up.

3. The Systems Commissioner shall start each piece of equipment or manufactured subsystem individually. Perform this work in the presence of the manufacturer's representative and the installer and perform all start up checks and remedy all individual equipment and installation defects and issues. Balance, test, and approve individual component performance prior to any System Commissioning of the system as a whole. This includes verification of connections and basic wiring, valves, and communication protocols. Provide all temporary measures to operate or verify components of the System without overall operation of the System.
4. Complete all checklists and performance all component FPT's successfully, and record for submission. Record all trials, including failures, in the system issues log.

#### 6. Systems Commissioning

1. The Commissioning Co-ordinator and System Commissioner shall be present during work for first trial runs of systems, and for balancing of systems and duration testing to satisfy that the system is fully functional for the intended use, service conditions, and life expectancy. Begin commissioning of systems in isolation from all other systems. After remedying all defects to system and equipment pieces from first runs of system, begin trial runs of systems in tandem and in coordination with other systems. Balance systems in isolation wherever possible, to isolate issues and problems, and provide final balance only after all systems likely to influence the operation of the system are functioning. Perform final trial runs of systems during several periods of different weather and conditions wherever possible. Provide such further commissioning work as required to evaluate systems that are largely influenced by change of season, during warranty period and at no cost to Owner.
2. Provide advance notification of initial systems commissioning trials to the Owner, Consultant, and to the Owner's Third Party Commissioning Consultant, such that the Owner's representatives may witness the initial commissioning if they elect to do so.
3. Start each system individually and perform all checks and remedy all individual equipment and installation defects prior to commencing any final systems commissioning involving more than one system.
4. Perform commissioning in strict conformance with further requirements of energy usage, sustainability, and optimisation objectives in order to attain certification of systems, and LEED procedures where applicable.
5. Complete all checklists and performance all internal system FPT's successfully, and record for submission. Record all trials, including failures, in the system issues log.

### 3. FINAL COMMISSIONING

1. The Final Commissioning phase of commissioning a system and the facility shall
2. Commissioning of System in Relation to All Other Systems and External Connections
  1. Upon resolution of issues and optimization of performance within an individual system, proceed to a final commissioning stage for the system. Provide all work and services to liven all external connections to other systems and perform Functional Performance Tests that verify performance relationships where the system issues instructions or controls performance of aspects of other systems, or where the system receives input from or provides output to another system.
  2. Provide all work and services to verify performance of the system in each sequence of operation and seasonal condition that forms part of the conditions of service for the system.
  3. Complete all checklists and performance all external system FPT's successfully, and record for submission. Record all trials, including failures, in the system issues log.
3. Reporting

1. Prior to application for Substantial Performance of the Work, the System Commissioner and the Contractor's Commissioning Co-ordinator shall issue a report accepting procedures and the completed component and/or building system installation. Include raw-data and results of all tests performed, including failures, and include all completed checklists and Function Performance Tests of the System. Provide final copy of issue logs with entries of all tests and issues tracked and that status of each is resolved.
2. The issued report shall state that the installation of the Building System and/or Product is in conformance with the System Commissioner's recommendations, and shall not impede the performance of the System or its ability to exceed the requirements of this Contract. The report shall discuss and make recommendations for particular use requirements applicable to service conditions present in the completed Work.
4. Operation and Maintenance Training
  1. Immediately after achieving Substantial Performance of the Work, schedule operation and maintenance training sessions together with the Owner's operations and maintenance forces.
  2. The Contractor's Commissioning Co-ordinator shall be present for all training. For each System, the System Commissioner shall provide instruction to the Owner's nominees, using the Manuals specified elsewhere in the Documents and previously delivered, regarding recommended care, operation, inspection, adjustment, and maintenance for the System and components in service.
  3. Allow for timing and duration of visits to suit Owner's representative's scheduling and requirements.

#### **4. WORK DURING WARRANTY PERIOD**

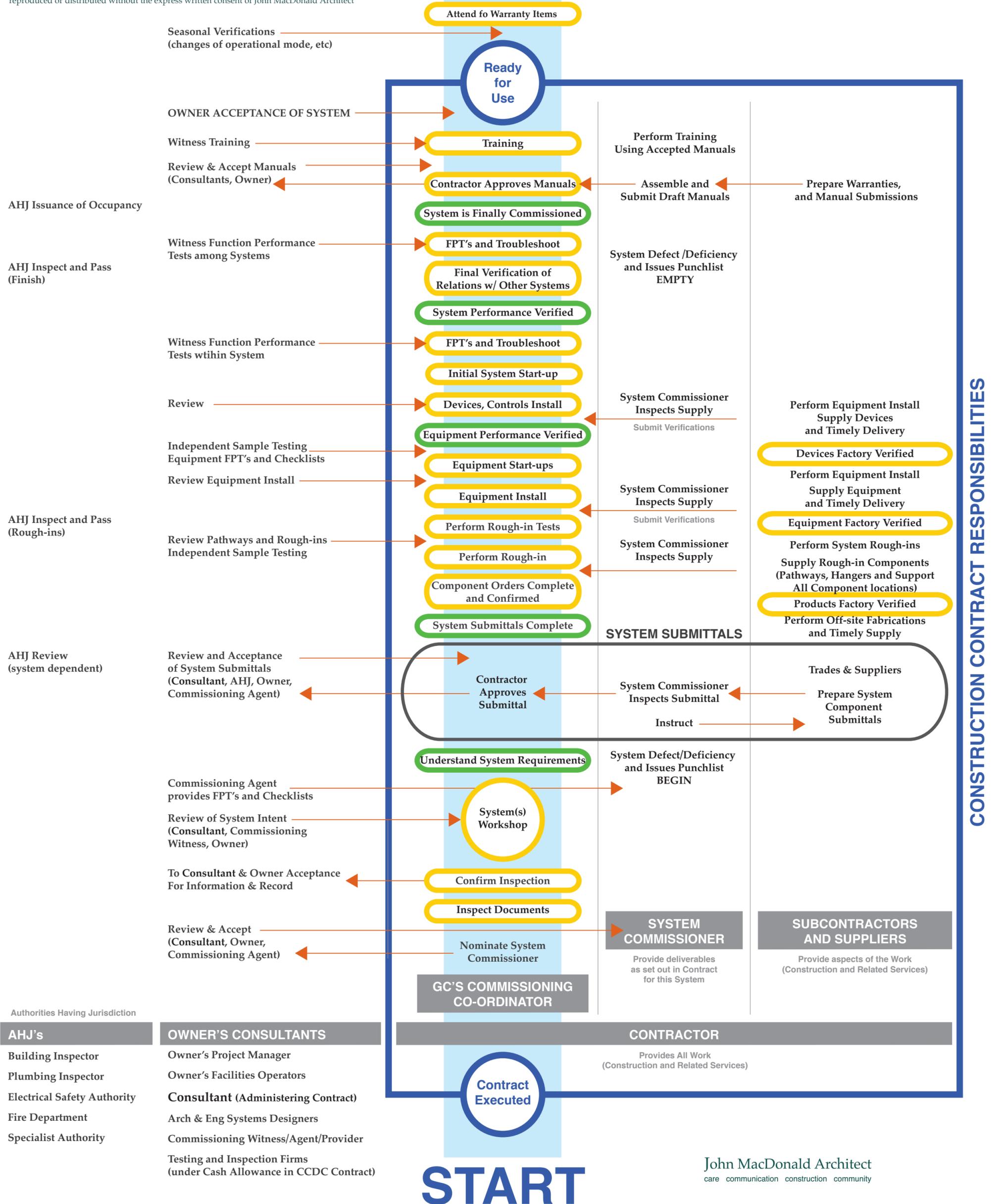
1. Troubleshooting, Call-back, and Problem Repair
  1. Provide on-going review and attendance to building call-back, maintenance, and repair problems during the warranty period for the equipment or system for which the representative is responsible. Pay all costs for this service.
  2. See GC 12.3 Warranty as amended by the Supplementary Conditions, and Section 017780 for further requirements during the Warranty Period.
2. System Commissioning at Change of Season
  1. System performance during other seasons than the season in which facility occupancy and hand-over to Owner Ready for Use shall be accomplished through forced Functional Performance Test (FPT) and simulation wherever possible. Provide all such testing, in accordance with Owner's Third Party Commissioning Consultant and FPT's in the Commissioning Plan.
  2. Where performance during off-seasons cannot be properly simulated, and in all cases for HVAC systems, provide further services and perform further work during the Warranty Period to commission and verify performance of the system in each off-season, as directed by the Owner's Third Party Commissioning Consultant and FPT's in the Commissioning Plan.
  3. The Systems Commissioner and the Commissioning Co-ordinator shall provide further reporting and submission to the Consultant and Owner's Third Party Commissioning Consultant showing verification of system performance to each applicable season.

**END OF SECTION**

# System Commissioning During the Construction Phase

RoW 84 Frederick Street Shelter Renewal

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# START

John MacDonald Architect  
care communication construction community

## 1. GENERAL

### 1. Related Sections

1. Contractor is to thoroughly review all sections and divisions of the specification, and the drawings, to ensure that work of this section is understood together with all related items of the Contract.
2. Particular attention is drawn to the following:
  1. Form of Agreement and General Conditions as modified by the Supplementary Conditions
  2. All sections of Division 01, especially individual requirements for photographs and records.

### 2. Photographic Record

1. Prior to the start of onsite work, including site enclosure:
  1. The Contractor and Owner's representative shall tour the site and building, and shall photographically record the existing conditions of all curbs, walks, roadways, exterior surface finishes, landscaping, and the existing Facility surfaces and interior.
  2. The Contractor shall take the photographs and submit as a record to the Consultant. All defects and cracks in surfaces shall be recorded. Failure to record means the surface has no defects. Annotate all photographs in to grouping by key area of the building, or by room number.
2. Record of Construction Progress:
  1. The Contractor shall photographically record the Work as the construction progresses. Photograph a representative sample of aspects of the Work accomplished that have been covered as of the date of the last application for payment.
  2. The photographic record referenced above shall be more extensive for the particular Building Systems identified in Section 019010, so that the Owner has a complete photographic record of the portions of the Building System that are concealed in the finished Work, including but not limited to under-slab conduit and services, equipment and services within ceiling areas, and systems within shafts and service spaces.
  3. Submit photographic record with each monthly application for payment.
  4. Submit photographic record with Facility Manuals.

### 3. As-Built and Record Documents

1. From the electronic format contract set provided by the Owner in accordance with the Contract, print sets of Documents for rough record drawing purposes. Maintain one set at job site to be used for as-built notations only. Maintain a second set offsite for use as backup.
2. On one set record accurately deviations and changes from Contract Documents as Work progresses. Failure to keep the rough set current shall be grounds for a finding of defective work under the General Conditions, and shall result in a removal of Contract Amounts from the Contract that the Consultant deems are associated with this requirement of the Work and Contract.
3. The Contractor marks changes neatly in red ink at regular meetings of site superintendent and trade contractor foremen convened for this purpose.
4. Record following information:

1. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvement;
  2. Location of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of structure;
  3. Field changes of dimension and detail; and
  4. Changes made by Change Order, Change Directive, or Supplemental Instruction.
5. Review status of the rough as-builts prior to each site meeting. Report status and present set for review at meeting. Failure to present set shall be grounds for delay of Contractor's claim for payment.
  6. Prior to application and Consultant's review for Certificate of Substantial Performance, inspect as-builts to ensure that all changes to the Work have been noted. Neatly transfer notations to the second set (the Record Drawings) and submit both sets to Consultant for review and acceptance.
  7. Upon acceptance of the Record Drawings, pay for and obtain an electronic AutoCad version of the drawings in a format acceptable to the Owner, and arrange and pay for transferring of all changes (including for change orders), notes, and marks from the record drawings to the applicable electronic copies of the drawings. As built drawings are to be submitted in AutoCad 2010. Submit 3 (three) sets of CD discs to the Owner for its ownership, copyright, and unlimited use. Pay all costs for this work and be responsible for contents of record documents.
  8. Non-performance of this Work within two months of achievement of Substantial Performance of the Work shall be grounds for the Owner to contract and obtain such documents from another party and deduct their cost from the Contract Price.
  9. Upon request, and subject to completion of the Consultant's electronic file transfer agreement request, the Consultant will provide to the Contractor with CAD versions of the Tender issue drawings, for Contractor's use in producing as-built and record documentation.
  10. The Owner's Project Team personnel shall be allowed to review the field construction drawings during the course of the Work. As such the documents must reflect field changes being made to the Building Systems at each stage of construction.

**END OF SECTION**

## 1. GENERAL

### 1. Related Sections

1. Contractor is to thoroughly review all sections and divisions of the specification, and the drawings, to ensure that work of this section is understood together with all related items of the Contract.
2. Particular attention is drawn to the following:
  1. Form of Agreement and General Conditions as modified by the Supplementary Conditions;
  2. All sections of Division 01, especially provisions for Contract Close-out and Project Documents;
  3. Specific Sections of the specification for additional manual and maintenance requirements;
  4. Written Recommendations of Product Suppliers for Maintenance of Products in first year of service, as obtained by the Contractor and Trade Contractors directly from manufacturer of Product or Material.

## 2. MAINTENANCE MANUALS

### 1. General

1. Provide an interactive PDF of Maintenance Manuals formatted as follows:
  1. Cross-referenced pdf format including electronic table of contents and search functions, using pdf format of all Submittals. No scanned copies of data or submittals shall be allowed.
  2. Enclose title sheet, labelled as applicable, project name, date and list of contents.
  3. Organize contents into applicable Building Systems identified in Section 019010. For items that do not clearly form part of a Building System, provide further organisation of pdf document in accordance with sections of the specifications, clearly tabbed.
  4. When only one pdf document is required, a complete index shall be provided. When more than one file is required, the first file shall contain a complete index of all files and each succeeding file shall contain an index denoting its own contents. Files shall be clearly titled and identified.
2. Prior to making application for Substantial Performance of the Work, and at minimum 4 (four) weeks prior to handover of the Work to the Owner, submit to Consultant a rough draft of the Maintenance Manuals, consisting of items noted in this section and as requested elsewhere in the Contract Documents, in English, as follows:
  1. A complete list of Subcontractors and Suppliers, commissioning representatives, together with names and contact information for use during the Warranty Period;
  2. A complete and chronologically organized chart of warranties by warranty expiration date;
  3. All draft unsigned warranties, as outlined in Section 017780;
  4. Interactive PDF of all submissions;

5. Maintenance instructions for finished surfaces and materials;
  6. Copy of hardware and finish schedules;
  7. Description, operation and maintenance instructions for equipment, and parts lists, organized by Systems Indicate specific nameplate information such as make, size, capacity, and serial number for Product or Material.
  8. Additional material used in project listed under various Sections showing name of manufacturer and source of supply.
  9. Charts, diagrams and equipment reports identified in mechanical, electrical and general notes to Drawings,
  10. Copies of valve charts and controls schematics for all building systems employing such items.
  11. Copies of all building system reporting and certification as required by Section 019010 and elsewhere in the specification.
  12. Copies of all system verifications and commissioning for Building Systems.
3. Neatly type lists and notes. Use clear drawings, diagrams and manufacturers' literature.
  4. Maintenance Manuals must be fully available to the Owner and accepted by the Consultant before the Consultant will consider Completion of the Contract.
  5. Within a period of four (4) weeks prior to the completion date of the project, or designated date of the system takeover by the Owner, (providing the Maintenance Manuals are available) the Owner's maintenance personnel shall be allowed on the site to familiarize themselves with the equipment and Systems and witness commissioning activities if so requested.

**END OF SECTION**

## 1. MAINTENANCE MATERIALS

### 1. General

1. Provide all overage, extra stock, and maintenance materials prior to application for Substantial Performance of the Work.
2. For required materials, see this Section as well as other portions of Specifications and notes on Drawings and Schedules.
3. Deliver to a location and at a time specified by the Owner, and as follows:
  1. Use unbroken cartons, or if not supplied in cartons, material shall be strongly packaged;
  2. Clearly mark cartons or packaging as to contents, project name, and supplier; and
  3. If applicable give colour and finish, Room No., or area where material is used.
4. Contractor replaces at own expense any incorrect or damaged maintenance materials delivered to Owner, including damage during shipment or unloading.

### 2. Maintenance Materials

1. This Contract includes the supply of all materials intended to be consumed by the operation, use, and enjoyment of the finished Work by the Owner for the first year of intended service use, except consumables, as well as further specific materials noted herein.
2. The Contractor, Suppliers, and all Subcontractors shall thoroughly review the Products and Materials supplied as a portion of the Work, and shall provide any and all materials necessary to maintain the Work in accordance with warranty requirements, good maintenance practice, and as further described in Suppliers' written recommendations for maintenance in the Facility Maintenance Manuals. The sole exception to this requirement is for consumables, and for cleaning products and surface treatment products for finishes that may reasonably be expected by the Owner to be consumed in the course of janitorial duties.
3. Provide at a minimum the following maintenance materials, and include for these materials in the Contract Price:
  1. A one year supply of all maintenance materials above-noted, and at a minimum:
    1. one extra set of each type of filters for fixtures, system components, or equipment;
    2. one set of replacement belts for all equipment using same;
    3. one extra electrical battery of all types used in the finished Work;
    4. one 4 litre container of each colour and type of paint used in the finished Work;
    5. continuous and unused overage of each type of wall base, sheet flooring, ceramic tile, ceiling tile, or other similar finish material equivalent to 5% of area used in the finished Work;
    6. extra set of all special tools required for maintenance work to equipment and for diagnostics and operation of systems; and
    7. other maintenance materials as specified elsewhere in individual sections of the specification.

**END OF SECTION**

## 1. GENERAL

All bidders shall note that this Section contains Building Flush-out Requirements that involve services and work by the Contractor and all Trade Contractors, including but not limited to the Mechanical Trade Contractor and the BMS Trade Contractor, to program and run the HVAC system while under the care and control of the Contractor, as a functioning HVAC system, such that the Flush-out is performed as set out in this Section. The bidders shall include all costs and shall design for accomplishment of this Flush-out as set out in this Section. Indoor Air Quality testing shall not be accepted as a substitute for the Flush-out requirement.

### 1. Related Section

1. Contractor shall thoroughly review all sections and divisions of the specification, and the drawings, to ensure that work of this section is understood together with all related items of the Contract.
2. Particular attention is drawn to the following:
  1. Form of Agreement and General Conditions as modified by the Supplementary Conditions
  2. All Sections of Division 01
  3. Section 013030 Submittals
  4. Division 2 Selective Demolition Sections
  5. Section 062000 Finish Carpentry
  6. Section 064000 Architectural Woodwork
  7. Section 072500 Weather Barrier Systems
  8. Sections 078000 Fire and Smoke Protection Systems
  9. Section 079000 Joint Protection
  10. Division 09 Finishes
  11. Division 10 Specialties
  12. Divisions 20 and 23

### 2. Definitions

1. *Volatile Organic Compounds (VOCs)*: Organic chemicals that produce vapours readily at room temperature and normal atmospheric pressure (e.g. gasoline, solvents, etc.). VOCs react with sunlight and nitrogen to form ground-level ozone, a chemical that has detrimental effect on human health, agricultural crops, forests, soil, groundwater and ecosystems.
2. *Carpet and Rug Institute (CRI) Green Label*: a program established by the national trade association representing the carpet and rug industry to identify carpet products that have been tested by an independent laboratory and have met the criteria for low VOC emissions.
3. *Urea-Formaldehyde (UF)*: A combination of urea and formaldehyde that readily decomposes at room temperature. It is found in some glues/resins used to manufacture furniture, composite woods (e.g. particle board), agri-fibre products and laminated assemblies. UF has detrimental effect on human health and may include symptoms such as eye, nose, and throat irritation, wheezing and coughing, fatigue, skin rash and severe allergic reaction.
4. *Agrifiber*: recovered agricultural waste fibre, from sources including but not limited to cereal straw, sugarcane bagasse, sunflower husk, walnut shells, coconut husks and agricultural prunings, that are processed and mixed with resins to produce products with characteristics similar to those derived from wood fibre.

### 3. Responsibilities of the Contractor

1. The site superintendent (or other person designated by the Contractor acceptable to the Consultant and Owner) shall be responsible for all aspects (during construction) related to indoor air quality management.

2. Indoor air quality management activities shall include:
  1. Identifying, implementing and documenting measures to achieve the indoor air quality management objectives.
  2. Supervising on-site indoor air quality management activities on a regular daily basis.
  3. Coordinating indoor air quality management tasks with Subcontractors to ensure timely and orderly progress of the Work.
  4. Conducting indoor air quality management inspections and making necessary repairs.
  5. Maintaining an indoor air quality inspection log to document observations, deficiencies and corrective actions.
  6. Preparing indoor air quality management documentation and submittals as detailed herein.
  7. Selecting products/materials that meet the requirements specified herein and in individual specification sections to achieve best indoor air quality in the finished Facility, subject to Contract requirements.
  8. Submitting product and material documentation as detailed herein prior to ordering a product or material.
  9. Reporting indoor air quality management progress to the Consultant.
4. Project Meetings
  1. During Pre-construction Meeting review IAQ management requirements including:
    1. Indoor air quality management objectives.
    2. Indoor air quality management requirements and procedures.
    3. Indoor air quality management documentation and submittals.
5. Reference Standards and Codes
  1. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA).
  2. IAQ Guidelines for Occupied Buildings Under Construction. First Edition, 1995 ASHRAE. ANSI/ASHRAE 52.2-1999: Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size.
  3. EPA Protocol for Environmental Requirements, Testing for Indoor Air Quality Baseline IAQ.
  4. Green Seal. Paints (GS-11). January 1997. May 1993.
  5. Green Seal. Anti-Corrosive Paints (GC-03). January 1997.
  6. Canadian Green Building Council. "Indoor Environmental Quality Credit 3: Construction IAQ Management Plan and Credit 4: Low-Emitting Materials" Leadership in Energy and Environmental Design Reference Guide for New Construction and Major Renovations (LEED Canada-NC).
6. Quality Control
  1. Meet or exceed the recommended Design Approaches of the Sheet Metal and Air Conditioning Contractors National Association (SMACNA) IAQ Guidelines for Occupied Buildings under Construction, 1995, Chapter 3.

2. Protect construction workers and future building occupants from indoor air quality problems resulting from construction activities and building materials.
3. Reduce the production and circulation of pollutants during construction.
4. Protect equipment and absorptive materials stored and installed on-site from moisture, dust and dirt accumulation during construction.
5. Prepare the building for occupancy following construction and prior to occupancy.

## 2. SUBMISSION REQUIREMENTS

1. Submit in accordance with Division 01:
  1. Confirmations regarding selected Products for their potential effect on Indoor Air Quality during the construction period and upon handover of the Facility to the Owner Ready for Use.
  2. IAQ Management Inspection Log
    1. Contractor to keep and submit an IAQ Management Inspection Log and shall produce such log for review upon request of Consultant.
    2. Update log on a minimum weekly basis.
    3. Issue instructions to Trade Contractors, where actions may be required, to address IAQ related items and Work.

## 3. BASIC PRODUCT REQUIREMENTS

1. Adhesives and Sealants
  1. All adhesives and sealants that are applied onsite and fall within the building weather barrier must have a VOC content less than the limits of the State of California's South Coast Air Quality Management District (SCAQMD) Rule 1168. Please note that specific VOC Limits are stated within individual specifications.
  2. The VOC content limits of SCAQMD Rule 1168 are as follows:

<b>Architectural Adhesives</b>	<b>VOC Limit (g/L)</b>
Wood Flooring Adhesive	100
Subfloor Adhesive	50
Ceramic Tile Adhesive	65
Drywall and Panel Adhesive	50
Cove Base Adhesive	50

3. For the following substrate specific adhesives stated VOC limits shall not be exceeded.

<b>Substrate Specific Adhesives</b>	<b>VOC Limit (g/L)</b>
Plastic Foam Adhesive	50
Porous Material (except wood) Adhesive	50
Fibreglass Adhesive	80
Single Ply Roof Membrane Adhesive	250

<b>Specialty Adhesives</b>	<b>VOC Limit (g/L)</b>
Plastic Cement Welding Adhesive	250
Adhesive Primer for Plastic	550
Contact Adhesive	80
Special Purpose Contact Adhesive	250

4. Upon request, submit supporting documentation for all adhesives and sealants that are applied onsite and fall within the building weather barrier.

2. Paints and Coatings

1. All paints and coatings that are applied onsite and fall within the building weather barrier must have a VOC content less than the limits of Green Seal Standards GS-11 and GC-03 and the State of California’s South Coast Air Quality Management District (SCAQMD) Rule 1113.
2. The VOC content limits of Green Seal Standard GC-03 are as follows:

<b>Anti-Corrosive Paints</b>	<b>VOC Limit (g/L)</b>
Anti-Corrosive Paint, Gloss	250
Anti-Corrosive Paint, Semi-Gloss	250
Anti-Corrosive Paint, Flat	250

3. The VOC content limits of SCAQMD Rule 1113 are as follows:

<b>Coatings</b>	<b>VOC Limit (g/L)</b>
Bond Breaker	350
Clear Wood Finish, Varnish	275
Clear Wood Finish, Sanding Sealer	275
Clear Wood Finish, Lacquer	275
Clear Brushing Lacquer	275
Concrete-Curing Compound	350
Dry-Fog	400
Fire-Proofing Exterior Coating	350
Fire-Retardant Coating, Clear	650
Fire-Retardant Coating, Pigmented	350
Flat Coating	100
Graphic Arts (sign) Coating	500
Industrial Maintenance Coating	100
High Temp Ind Maintenance Coating	420
Magnesite Cement Coating	450
Mastic Coating	300
Metallic Pigmented Coating	500
Multi-Colour Coating	250
Non-Flat Coating	50
Pigmented Lacquer	275
Pre-Treatment Wash Primers	420
Primer, Sealer and Undercoating	100
Quick-Dry Enamel	50
Quick-Dry Primer, Sealer & Undercoating	100
Roof Coating	50
Roof Coating, Aluminium	100
Rust Preventative Coating	100
Shellac, Clear	730
Shellac, Pigmented	550
Specialty Primer	100
Stains	250
Stains, Interior	250
Waterproofing Sealer	100
Waterproofing Concrete	100
Wood Preservative, Below-Ground	350
Wood Preservative, Other	350
Low-Solids Coating	120

4. Upon request, submit supporting documentation for all paints and coatings that are applied onsite and fall within the building weather barrier.

#### 4. AIR QUALITY CONTROL DURING CONSTRUCTION

1. Schedule construction activities to minimise the amount of VOC's, odours and fumes absorbed by porous materials (e.g. ceiling tiles, carpet, etc.).
2. Complete applications of wet and odorous materials such as paints, sealants, and coatings before installing absorbent "sink" materials such as ceiling tiles, carpets, and fabric-covered furnishings.
3. Pollutant Source Identification
  1. Identify potential sources of indoor air pollutants on the construction site.
  2. Any construction activity or material that produces odour and/or dust is considered a source of air pollutants.
  3. Pollutant sources include, but are not limited to:
    1. Materials that produce detectable odour including but not limited to: paints, coatings, grouts, stains, adhesives, epoxy flooring, sealants, caulking, solvents, pesticides, fuels, and cleaning products.
    2. Materials that create dust, including but not limited to: concrete products, drywall, wood products, acoustic ceiling tile, insulation, and ceramic tile.
    3. Equipment that emit products of combustion or create odour and/or dust, including but not limited to: generators, compressors, cutting tools/saws, torches/welders, vehicles, and portable heaters.
    4. Construction activities that disrupt pollutants such as: demolition, repair, or renovation.
    5. Other: exterior site work, standing water, tobacco smoke
4. Minimize Pollutants Generated
  1. Minimise pollutants generated inside the building from the sources identified in this Section using the following measures:
    1. Prohibit smoking inside the building at all times.
    2. Fuel up equipment outside the building only.
    3. Store gasoline and solvents outside the building only.
    4. Restrict outdoor vehicular traffic and equipment operation from areas where emissions can enter the building.
    5. Reduce on-site emissions using equipment that burns propane/natural gas or that is powered by electricity.
    6. Exhaust pollutant sources directly outside using temporary or permanent ventilation equipment. Where exhaust is not feasible, locally re-circulate air through a portable air cleaner.
    7. Collect and bag sawdust from woodworking tools.
    8. Cover and/or seal all indoor sources of odour and dust.
    9. Use painting techniques that minimise odour (e.g roller instead of spraying).
    10. Use cleaning practices that minimise dust (e.g. vacuum instead of sweeping).
    11. Use cleaning products that minimise pollution, fumes, VOC's, etc.
    12. Prohibit the burning of garbage.
5. Pollutant Containment Measures
  1. Prevent the movement of pollutants from the sources identified in this Section to other areas in the building using the following measures:
    1. When possible, perform pollutant generating activities outside the building.

2. Move equipment, work and other pollutant sources to locations where they will have the least impact on indoor air quality.
3. Setup small, contained, designated work areas to contain pollutants:
  1. Avoid open areas and areas with high drafts.
  2. Erect dust curtains and barriers.
  3. Depressurise areas using temporary or permanent ventilation equipment.
  4. Use portable fans to exhaust pollutants (e.g. gas engine exhaust) to the exterior through windows, doors, etc. Ensure that adjacent windows, doors, etc. will not allow pollutants to re-enter the building.
  5. Close windows and doors adjacent to pollutant sources (e.g. dust, vehicle emissions, etc.) outside of the building. If windows and doors have not been installed, temporarily seal exterior openings with plastic, wood, etc.
  6. Pressurise occupied or completed areas of the building using temporary or permanent ventilation equipment.
6. Housekeeping Measures
  1. Prevent the accumulation of moisture, dust and dirt in the building from the sources identified under article 4.3.3 using the following measures:
    1. Perform localised cleaning immediately after a construction activity is completed and/or at the end of each day.
    2. Perform a full building clean-up at least once a week.
    3. Frequently clean interior surfaces to minimise dust and dirt accumulation by:
      1. Dusting with damp rags.
      2. Wet mopping.
      3. Sweeping using wetting agents and sweeping compounds.
      4. Vacuuming with equipment that contains HEPA filtration and/or a wet scrubber.
      5. Removing excess application of solvent-containing products.
      6. Promptly clean all spills (fuels, lubricants, paints, adhesives, etc.).
      7. Immediately removing any accumulated water indoors to protect interior surfaces and materials.
    4. Close exterior windows and doors or create temporary enclosures using plastic or wood to prevent moisture accumulation indoors.
    5. Cover, seal and protect materials stored and installed on-site from moisture, dust and dirt accumulation.
    6. Elevate materials stored on-site off the ground to protect from moisture and dirt accumulation.
    7. Do not install materials with evidence of moisture damage or excessive moisture accumulation.
    8. If necessary, use ventilation/dehumidification to control humidity levels within the building.
7. HVAC Systems Protection Measures
  1. Before & During Installation the Contractor shall:
    1. Cover with plastic and elevate off of ground, all ductwork, fittings, insulation, acoustic lining and equipment stored on site during construction.

### Indoor Air Quality (IAQ) Requirements

2. Seal all supply, return and exhaust openings as well as all temporary ductwork openings not under immediate work (e.g. open ends in ductwork runs) with plastic. Openings must be sealed immediately after installation in areas that will no longer be under work.
  3. Close/cover all hatches and access doors in HVAC equipment that will not be under work.
  4. Seal all HVAC equipment openings (e.g. inlets/outlets of air handlers, fans, VAV boxes, etc.) with plastic until ductwork is connected.
  5. Do not use mechanical rooms to store or collect construction waste materials.
  6. Install ceiling tiles and seal all openings into the plenum with plastic prior to final cleaning.
2. After Installation the Contractor shall:
1. Do not use mechanical rooms to store or collect construction waste materials.
  2. Do not operate any permanent HVAC equipment or systems during construction.
  3. Seal all openings in HVAC systems, ductwork and plenums as described above.
  4. If an HVAC system protection measures are not implemented, or if the system is operated during construction, the Contractor must provide duct cleaning services, plus all necessary access doors, at no extra cost to the contract.
3. After all construction and final cleaning work is complete the Contractor shall:
1. Remove all HVAC protection measures.
  2. Install new filters in all air handling equipment.
  3. Start-up all systems.
  4. Prepare systems for Testing, Adjusting and Balancing, and System Commissioning
8. All products/materials installed as a part of indoor air quality management measures shall be removed prior to building handover. Any remedial work required as a result of removing the measures is the responsibility of the Contractor. Perform such work promptly, with safeguards for continued achievement of air quality standards.
9. Inspections and Maintenance
1. The Contractor shall inspect all indoor air quality management measures and remedy any deficiencies on a weekly basis.
  2. Inspections shall be recorded in an IAQ Management Inspection log and shall denote the measures implemented at the time of inspection, any deficiencies as well as corrective actions taken.
  3. All Pollutant Containment, Housekeeping and HVAC protection measures will be reviewed by the Consultant during each site visit.
  4. The Contractor shall clean or replace any equipment or materials that are incorrectly stored or improperly protected at no cost to the Owner.

## 5. BUILDING FLUSH-OUT REQUIREMENTS

1. After all construction, final cleaning, Testing, Adjusting and Balancing, and Systems Commissioning work is complete to areas under the Contractor's control, perform a building flush-out.
2. Prior to commencement of building flush-out Contractor shall:
  1. Perform all corrective work related to deficiencies.
  2. Ensure new filters are installed in all air handling equipment.
  3. Flush-Out requirements prior to Occupancy:
    1. Maintain a minimum temperature of 16°C (60°F).

2. Where mechanical cooling is operated, maintain a relative humidity no higher than 60%.
3. The Contractor shall carry-out building flush-out measures for a minimum period of 14 days, operating such that 1 million litres of outdoor air are supplied to the space for each square metre of space prior to occupancy hand-over.
4. Flush-out requirements during Owner Move-in:
  1. Maintain a minimum indoor temperature of 16°C (60°F).
  2. Where mechanical cooling is operated, maintaining a relative humidity no higher than 60%.
  3. The Contractor shall carry-out building flush-out measures for a min. period of 7 days.
5. Flush-out requirements after Occupancy
  1. Supply outside air at a minimum rate of 0.045m<sup>3</sup>/minute/m<sup>2</sup> (0.15 cfm/ft<sup>2</sup>) for at least three hours prior to each time the building is occupied.
  2. Supply outside air at the greater of 0.045m<sup>3</sup>/minute/m<sup>2</sup> (0.15 cfm/ft<sup>2</sup>) or the design minimum outside air supply during times when the building is occupied.
  3. Continue the flush-out process described above until 3 million litres of outdoor air per m<sup>2</sup> has been supplied to the building as measured from occupancy handover.
6. Replace all filtration media in air handling equipment with new filters after the building flush-out is completed. Set all building operation to required normal occupied, non-occupied timetable and parameters.
7. Building Flush-out is a minimum requirements of the Contract, and in no circumstances shall be substituted by air quality testing in lieu of flush-out. Plan and achieve the construction schedule and Contract Time to include the required flush-out periods.

## 6. IAQ TESTING REQUIREMENTS

1. IAQ testing will be performed prior to occupancy of building where Owner doubts the quality of the IAQ measures and flush-out work undertaken. Cooperate with all such testing. The Commissioning Co-ordinator shall attend the testing.
2. Such indoor air quality testing will be carried out by and at the expense of the Owner. Costs for retesting upon failure to achieve performance is at the Contractor's expense.
3. The Contractor shall allow 3 days after all construction and final cleaning work is complete and prior to building occupancy for the Owner to conduct indoor air quality testing.
4. The Contractor shall perform all corrective work related to general deficiencies, Testing, Adjusting and Balancing, and Commissioning of Systems prior to indoor air quality testing, and shall notify the Consultant that the Work is ready to meet indoor air quality requirements for occupancy.

**END OF SECTION**

## 1. GENERAL

### 1. Related Sections

1. Contractor is to thoroughly review all sections and divisions of the specification, and the drawings, to ensure that work of this section is understood together with all related items of the Contract.
2. Particular attention is drawn to the following:
  1. Form of Agreement and General Conditions as modified by the Supplementary Conditions
  2. All sections of Division 01, especially sections for quality control and commissioning
  3. Individual sections of the specifications where further requirements for Building Systems and components are described
  4. Section 018010, Commissioning and Performance Verification

### 2. Building Systems Definitions

1. A *Building System* is defined in accordance with the modifications to Definitions in the Contract as an interrelated set of materials and Products provided in accordance with the requirements of the Contract and intended to ensure a particular performance during the expected service life of the Facility. This performance may include specific norms that form Contract requirements for capacity, resistance, soundness and integrity, compatibility, safety, longevity, and other factors that result from the achievement of the intended system design through the work of the Contractor.
2. *Control* is hereby defined as the method by which the operation of a *Building System* component, set of components, or the overall system (as the circumstance warrants) is attained, this includes the required performance of that component, set of components, or system that produces the functions necessary to achieve the design intent of that Building System in its anticipated service life, including its contribution to the performance of other Building Systems. The Contractor is specifically cautioned that this Contract requires complete control of all Building Systems, whether existing, altered, new or affected by this Contract. All product, material, and work required to achieve such control is included in the Contract Price and Contract Time. *Controls* shall be read with an equivalent meaning. *Controls* may be achieved through a variety of means as specifically set out in the Documents and as inferable from the required sequences of operation of the systems. The Contractor and all Trade Contractors are specifically cautioned that neither a system of energy management, building monitoring, nor building automation, nor a rough-in for such a system, nor a requirement that systems equipment be compatible or contain features for such system, shall replace the contract requirement for control of all systems to achieve their intended performance.
3. The Contractor and trade Contractors are specifically cautioned that the contract requires detailed design, layout, co-ordination, and commissioning services to ensure that the performance intent of the design prepared by the Consultant is achieved in the finished Work and Facility for each and all Building Systems. This requirement has monetary value as part of the Contract Amount. Failure to perform this requirement shall result in a reduction of the contract amount as found by the Consultant, regardless of the performance of other required aspects of the Contract.
4. Drawings for Building Systems are schematic diagrams only, and do not govern the amount of work, product, or material required to achieve conformance with Contract requirements.
5. Identification of Building Systems
  1. For a complete list of Building Systems, and assignment of responsibility for the systems to Contractor and trade contractors, refer to the List of Building Systems Schedule, appended to the end of this section, and bound within the specification.

## 6. Components of Building Systems

1. In general, each building system consists of components that work together as an integrated whole to ensure the accomplishment of the functions and performance requirements of the system. The components are generally grouped into the following categories:
  1. Devices ("end of line" items delivering performance, such as lights, diffusers, or similar)
  2. Pathways, conduits, pipes, and similar conductive components.
  3. Support for components to the building structural system or otherwise as allowed
  4. Equipment performing actions and processes, or providing circulation or other function. This may include subsystems (such as a chemical feed system on a hydronic system)
  5. accessories, appurtenances (that monitor, supervise, instruct and control the components of the system in relation to one another) and media which forms the conducted component (water, electricity, air, for instance)
  6. external connections that connect aspects of the system or its components to other systems (for instance, a supervisory flow switch on a sprinkler system, that communicates to the fire alarm system).
2. The systems specification sections are organised to clarify these components, and the external connections to the systems, to assist in co-ordination of the ways and means for accomplishing the work to the systems required by the Contract.
3. The order of precedence of Building Systems in the layout and routing of systems within the Work is generally as follows. Conform to this hierarchy unless specific acceptance is given by the Consultant.
  1. Relationships of systems dictated by statute or code (such as relationship of potable water piping and sanitary piping in trenches) over
  2. Structural System takes precedence over,
  3. location of systems in exposed surface locations over,
  4. location of non-pressurised liquid systems functioning by gravity, over
  5. pressurised liquid systems requiring maintenance drainage, over
  6. pressurised air distribution systems, over
  7. pressurised liquid and gas systems, over
  8. electrical distribution systems, over
  9. telecommunications and data distribution systems.
4. Code required systems of fire separation and egress take precedence over all systems, except where the Building Code provides for means of protection to penetrations of these systems using protective closures and devices.

## 7. Contractor's and Trade Contractor's Representatives

1. Commissioning Co-ordinator (See Section 018010 for description of duties and work required)
  1. The Contractor shall appoint a Commissioning Co-ordinator.
  2. This individual shall be a trained, knowledgeable and responsible individual who is under the direct employ of the Contractor, and who shall be dedicated to this Contract at all times necessary for the duties entailed.
  3. The individual so nominated shall be acceptable to the Owner and Consultant.
  4. The Commissioning Co-ordinator shall not be changed during the course of the Work without acceptance of this change by the Consultant.
2. Building System Commissioners (See Section 018010 for description of duties and work required)

1. For each Building System in the Work, and in accordance with the List of Building Systems appended to this specification section, the Contractor and applicable Trade Contractor shall nominate a System Commissioner.
  2. System Commissioners shall be acceptable to the Owner and Consultant.
  3. System Commissioners shall possess the knowledge and skills necessary to inspect and commission the applicable building system. Submit details of qualifications upon request. Specific systems specifications require trade contractor nomination of the individual.
  4. The System Commissioner, together with the Contractor, shall perform all related services described in Division 01 to ensure the co-ordination, quality control, conformance with Contract, commissioning, and performance of requirements for the building system.
  5. The System Commissioner for a specific system shall not be changed during the course of the Work without acceptance of this change by the Consultant.
8. Review of Building Systems Design Prior to Commencement of the Work
1. The Contractor's Project Manager, Superintendent, Commissioning Co-ordinator, and all Building Systems Commissioners (hereinafter the Contractor's Review Team) shall conduct a complete review of the requirements of the Contract Documents so as to fully familiarize themselves with the requirements for the provision of each building system under the Contract. This review must include an understanding of the intent of each building system, the function of each system component, and any portions of the Work that may impact the performance of any of the completed systems. The Owner and Consultant shall assist this review through participation at Building Systems Workshops, but the responsibility for achieving the review and complete understanding of the requirements of the systems and Contract rests solely with the Contractor and its Review Team.
  2. The Contractor shall employ personnel fully capable of conducting the above-noted review, and fully qualified through experience to co-ordinate the provision of the completed Building Systems. The Contractor shall design all means, methods, techniques, sequences and procedures and co-ordinate the various parts of the Work to ensure that Building Systems are provided in accordance with Contract Requirements.
  3. The Contractor's Review Team shall review all Building Systems for their relation to construction tolerances and movements in the building assemblies, including movements reasonably anticipated in the service life of the Facility, and shall ensure that Building Systems accommodate such tolerances and movements without damage, distortion, or other failure.
  4. The Contractor shall bring to the immediate attention of the Consultant any requirement of the Contract, or lack thereof, that in the opinion of the Contractor compromises the intent or potential performance of a building system.
  5. Commencement of the installation of any part of a building system shall be deemed to mean that the Contractor has completed the review and is fully satisfied that the system performance required by the design intent and the Contract Documents is achievable using the Contractor's proposed construction means, sequences, trades, and methods.
9. Responsibility for Ensuring System Performance in the Completed Work and Facility
1. The requirements for system performance that are to be achieved in the Work form an integral part of the Contract. Unless explicitly stated otherwise in the Contract, responsibility for ensuring the performance of Building Systems in accordance with their general design intent, referenced prescriptive and performance requirements, and interrelated function shall be the responsibility of the Contractor. The Contractor may not, without the express written permission of the Owner, further assign this responsibility to any subcontractor or trade contractor except as specifically stated in the Documents. Where specifically so stated in the Documents, the Contractor shall jointly bind itself and the Subcontractor to the responsibilities.

2. Provide all materials, products, work and services required to achieve the design intent and standards for detailed design, procedures, Products, systems, and execution of the Building System as it can reasonably be inferred from the Contract Documents and the Contractor's review of same, including its proper and co-ordinated relation to other Systems, at no additional cost to the Owner.
3. Warranties
  1. The Contractor shall provide a warranty in accordance with the General Conditions for each specifically identified Building System in the Work, for a minimum of one year following date of Substantial Performance and for such longer periods as identified in the Contract Documents.
  2. Where responsibility for ensuring performance has been assigned in the Contract to a specific Subcontractor, then both the Subcontractor and the Contractor shall provide such warranty.
  3. The Contractor is cautioned that a building system does not fall under the definition of "Product" under the Contract warranty provisions, as it includes both supply and installation.
10. Inspection, Startup, Commissioning and Final Commissioning of Building Systems
  1. The System Commissioner shall provide services as set out in Section 018010. This individual shall inspect the work upon the system as it progresses, shall submit monthly reports on progress. He or she shall organise, direct, and be present for all portions of the systems commissioning as set out in Division 01 of the specification and further as required in individual system specifications as they occur in other Divisions.

**END OF SECTION**

No.	Building System	Req'd? (Y/N)	Exist/ New?	System Responsibility		Spec. Section	Comments
				Design	Construction		
1.1	Emergency Egress System	Y	Ex.	JMA	GC	019521	to OBC requirements
1.2	Fire Separation System	Y	Ex.	JMA	GC	019522	Ex. to be made good
1.3	Barrier-free Path of Travel System	Y	Both	JMA	GC	019530	ex. & new, throughout all floors
1.4	Reserved						
1.5	Building Structural System						
	1. Structural System	Y	Ex.	Ex.	GC	019550	Ex. to remain, repair, ensure
	2. Shoring System	TBD	-	GC	GC	Div. 01	contractor to evaluate / provide
	3. Scaffolding System	TBD	-	GC	GC	Div. 01	contractor to evaluate / provide
2-6	Reserved						
7.1	Environmental Separation Systems						
	1. Roofing Systems	Y	New	JMA/RJC	GC/Roofing Trade	Div. 07	Re-roofing of existing
	2. Exterior Wall Enclosure Systems	Y	Ex.	JMA/RJC	GC/Masonry Trade	Div. 04	Repair & repoint ex. Mass walls
	3. Overhanging Floor Enclosure Systems	Y	Ex.	JMA/RJC	GC	Div. 07	Ex. Breezeway soffit
	4. Curtainwall Systems	N	-	-	-	-	not applicable
	5. EIFS (Exterior Insulation Finish System)	N	-	-	-	-	not applicable
8.1	Roll-up Door System	N	-	-	-	-	not applicable
8.2	Automatic Entrance Door System	N	-	-	-	-	not applicable
9.1	Interior Finish Systems	Y	New	JMA	GC	Div. 09	to all interior areas
10	Reserved						
11.1	Storage Racking System	N	-	-	-	-	not applicable
11.2	Loading Dock system	N	-	-	-	-	not applicable
11.3	Parking / Entry Control System	N	-	-	-	-	not applicable
11.4	Scoreboard System	N	-	-	-	-	not applicable
11.5	Process Equipment Systems	N	-	-	-	-	not applicable
11.6	Waste Disposal System	N	-	-	-	-	not applicable
12.1	Window Shading System	Y	New	JMA/Owner	GC	Div. 12	window shades, as indicated
13.1	Air-Supported Structure System	N	-	-	-	-	not applicable
13.2	Vibration Control System	N	-	-	-	-	not applicable, local to equip
13.3	Sound Control System	N	-	-	-	-	No passive sound masking
14.1	Conveying Systems						
	1. Elevator System	Y	Ex.	Owner	N/A	-	Ex. to remain
	2. Escalator or Moving Walk System	N	-	-	-	-	not applicable
	3. Pneumatic Tube System	N	-	-	-	-	not applicable
15-19	Reserved						
21.1	Fire Suppression & Extinguishing System						
	1. Sprinkler System	Y	Ex.	-	GC/Sprinkler Trade	-	Ex. to remain, local to Kitchen
	2. Standpipe System	N	-	-	-	-	not applicable
	3. Commercial Kitchen Suppression System	Y	Ex.	Owner	-	-	Ex. to remain, clean
	4. Clean Agent Suppression System	Y	Ex.	Owner	-	-	Ex. to remain
	5. Dry Chemical Suppression System	N	-	-	-	-	not applicable
22.1	Plumbing Systems						
	1. Potable Water System	Y	Alter	MA Bryan	GC/Plumbing Trade	Div. 22	modify to suit new fixtures
	2. Non-Potable Water System	N	-	-	-	-	not applicable
	3. Sanitary Sewage System	Y	Alter	MA Bryan	GC/Plumbing Trade	Div. 22	extend and modify to suit new
	4. Storm Drainage System	Y	Alter	MA Bryan	GC/Plumbing Trade	Div. 22	new roof drains
	5. Gas Distribution System	Y	Alter	MA Bryan	GC/Gas Trade	Div. 22	Disconnect & reconnect at RTU
	6. Special Gases Systems	N	-	-	-	-	not applicable
	7. Compressed Air System	N	-	-	-	-	not applicable
	8. Vacuum System	N	-	-	-	-	not applicable
	9. Swimming Pool Plumbing System	N	-	-	-	-	not applicable
23	The HVAC Systems	Y	Alter	MA Bryan	GC/HVAC Trade	Div. 23	Clean ex., Alterations, & New
23.1	Thermal Generation Systems						
	1. Heat Generation Systems (Hydronic)	Y	Ex.	MA Bryan	GC/HVAC Trade	Div. 23	Ex. boilers
	2. Refrigeration Generation Systems	N	-	-	-	-	not applicable
23.2	Heat Transfer System						
	1. Hydronic Heat Transfer System	Y	New	MA Bryan	GC/HVAC Trade	Div. 23	Repair and new rads, units
	2. Chilled Water Transfer System	N	-	-	-	-	not applicable
	3. Thermal Storage Systems	N	-	-	-	-	not applicable
23.3	Air Distribution Systems						
	1. Air Distribution Systems	Y	modify	MA Bryan	GC/HVAC Trade	Div. 23	alter existing, clean system
	2. Humidification Subsystem	N	-	-	-	-	not applicable
	3. Exhaust Systems	Y	modify	MA Bryan	GC/HVAC Trade	Div. 23	alter existing, clean system
	4. Air Transfer Systems	Y	modify	MA Bryan	GC/HVAC Trade	Div. 23	alter existing, clean system
	5. Special Systems	N	-	-	-	-	not applicable
	6. Dust Collection System	N	-	-	-	-	not applicable
	7. Spray Booth System	N	-	-	-	-	not applicable

No.	Building System	Req'd? (Y/N)	Exist/ New?	System Responsibility		Spec. Section	Comments
				Design	Construction		
24	Reserved						
25.1	Building Monitoring System	Y	New	MA Bryan	GC/HVAC Trade	Div. 25	modify existing
26	Electrical Systems						
26.1	Power Generation Systems						
	1. Emergency Electrical Generation System	N	-	-	-	-	none existing, none proposed
	2. Back-up Generating System	N	-	-	-	-	not applicable
	3. Wind Energy Generation System	N	-	-	-	-	not applicable
	4. Solar Energy Generation System	N	-	-	-	-	not applicable
26.2	Electrical Distribution System						
	1. High voltage (more than 35,000 V)	N	-	-	-	-	not applicable
	2. Medium voltage (over 575 to 35,000V)	Y	Exist.	Mighton	GC/Electrical Trade	Div. 26	Exist. To remain
	3. Low voltage (575 V & under)	Y	Alter	Mighton	GC/Electrical Trade	Div. 26	modify existing, new devices
	4. Grounding System	Y	Exist.	Mighton	GC/Electrical Trade	Div. 26	Ensure existing
26.3	Lighting System						
	1. Emergency Lighting System	Y	Alter	Mighton	GC/Electrical Trade	Div. 26	ex. to remain, add new
	2. Interior lighting system	Y	Alter	Mighton	GC/Electrical Trade	Div. 26	replace existing, new
	3. Exterior lighting system	Y	Alter	Mighton	GC/Electrical Trade	Div. 26	replace existing, new
	4. Special purpose lighting	N	-	-	-	-	not applicable
26.4	Lighting Management Systems						
	1. Occupant & Daylight Sensing System	Y	New	Mighton	GC/Electrical Trade	Div. 26	to Library only, stand alone
	2. Lighting Automation System	N	-	-	-	-	none existing, none proposed
26.5	Electric Heating Systems	Y	Alter	M.A. Bryan	GC/Electrical Trade	Div. 26	replace existing heaters, new
26.6	Special Systems						
	1. Battery power system (UPS)	N	-	-	-	-	Local to equipment, by Owner
	2. Lightning Protection System	N	-	-	-	-	no existing, no new
27	Communication Systems						
	1. Data Systems	Y	Alter	JMA/Mighton	GC/Electrical Trade	Div. 27	New WIFI AP system
	2. Voice Systems	Y	Alter	JMA/Mighton	GC/Electrical Trade	Div. 27	Existing to remain
	3. A/V Systems	N	-	-	-	-	none existing, none proposed
	4. Public Address System	N	-	-	-	-	none existing, none proposed
	5. Centralized Clock System	N	-	-	-	-	none existing, none proposed
28	Electronic Safety and Security Systems						
	1. Fire Alarm System	Y	Alter	Mighton	Elec./Owner's Trade	Div. 28	extend existing, including p/a
	2. CCTV Video Surveillance System	Y	Alter	JMA/Mighton	Elec./Owner's Trade	Div. 28	new, to Owner requirements
	3. Access Control System	Y	Alter	JMA/Mighton	Elec./Owner's Trade	Div. 28	new, to Owner requirements
29	Reserved						
30	Reserved						
31	Site Grading and Drainage System						
	1. Surface Drainage System	Y	Ex.	JMA	GC/Site Services Trade	Div. 31	Alter ex. locally in Courtyard
	2. Storm Sewerage System	Y	Ex.	JMA	GC/Site Services Trade	Div. 33	Connect RWLs to Ex. STM
	3. Erosion and Sedimentation Control System	Y	Ex.	JMA	GC/Siteworks Trade	Div. 31	Temporary measures, Div. 01
	4. Perimeter Drainage System	Y	Ex.	JMA	GC/Site Services Trade	Div. 33	Ex. to remain
	5. Stormwater Infiltration System	-	-	-	-	-	not applicable
32	Site Finishes System						
	1. Hardscaping	Y	Alter	JMA	GC/Siteworks Trade	Div. 32	Alter existing and install new
	2. Landscaping	Y	Ex.	-	Owner, N.I.C.	-	Owner to make good existing
33	Site Servicing Systems						
	1. Site Water Supply System	Y	Ex.	-	-	-	Existing to remain
	2. Site Fire Suppression Water System	N	-	-	-	-	Existing to remain
	3. Site Sewage System	Y	Ex.	-	-	-	Existing to remain
	4. Septic System	N	-	-	-	-	not applicable
	5. Site Gas Supply System	Y	Ex.	-	-	-	Existing to remain
	6. Site Electrical, Electrical Service System	Y	Ex.	-	Electrical Trade	Div. 33	Existing to remain
34-50	Reserved						

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 01, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.
2. The Contractor is specifically cautioned that the Work requires performance of related services to assist the achievement of the performance objectives for this building system, as described in Section 019010 and this Section. The Contractor shall organize provision of the components of this building system to achieve the intent of the building system design, and shall provide all products and execution reasonable inferable as necessary to achieve the performance objectives and intent of the design.
3. The Contractor shall thoroughly review all Sections of the specifications and all drawings, to ensure that the contract requirement for provision of a complete and functioning Emergency Egress System throughout the Work is achieved where such systems are identified on drawings or in the specification.
4. The following related systems and components of the Emergency Egress System are described elsewhere:
  1. Work to Existing Building Division 01
  2. Removals of Existing Division 02
  3. Fire Separation System Section 019522
  4. Barrier Free Path of Travel System Section 019530
  5. Interior Lighting System Section 265100
  6. Emergency Lighting System Section 265200
  7. Fire Detection and Alarm Systems Section 283100
5. The following related systems and components of related systems provide inputs to and receive outputs from the Emergency Egress System. They are described elsewhere as noted:
  1. Outdoor areas of assembly, as required by Building Code: As established by Owner
  2. Firefighter access, as required by Building Code.
6. The Emergency Egress System indirectly affects the following systems described elsewhere:
  1. Digital Occupancy and Daylight Management Control System Division 26
  2. Electronic Access Control & Intrusion Detection System Division 28
7. System Intent
  1. The intent of the Emergency Egress Systems is to ensure the safe evacuation of building occupants, from the building, through pathways of travel through building exits, to an exterior open space protected from fire exposure from the building. Systems may require installation of new products and assemblies, work to existing assemblies and materials, or a combination of existing and new construction. The Egress System shall be commissioned prior to handover of the addition for Owner's use.
  2. The system is existing, and must be maintained at all times throughout the construction period through temporary measures. All such temporary measures are included in the work of this Contract and the Contract Price.

8. In general, the Emergency Egress System includes, but is not limited to, the following components:
  1. devices for alerting occupants to the presence of an emergency situation requiring egress, such as components of a Fire Detection and Alarm System (new, required by this Contract).
  2. devices for identifying and providing wayfinding to appropriate egress pathways and to the exterior of the building, including emergency lighting and emergency exit signage. (new, required by this Contract).
  3. pathways of travel of clear width and character to meet applicable codes and regulations, including but not limited to building code defined pathways such as access to exit, public corridor, corridor providing access to the public, refuge areas and exits (new, required by this Contract for access to exits and exits).
  4. protection to maintain the quality of the pathways during an emergency situation so that all occupants have time for egress using the system, such as Fire Separations and Fire Suppression Systems (new, required by this Contract).
  5. accessories and appurtenances to regulate, monitor, maintain, and supervise the system and protect risk to occupants, including but not limited to doors and other secondary elements of the system and its subsystems (new, required by this Contract).
  6. external connection of components of the system to other systems, such as connection of fire and smoke detection devices to a signal control station that will be monitored by the Owner's access control, safety and security Systems (new, required by this Contract).
9. The routing of the pathway components of this building system and the requirements of this system shall take the precedence of all other building systems, where interference with proposed routing or other systems is encountered in the Work or in relation to existing conditions. Accommodate components of this system in laying out new or relocated portions of other systems.
10. The location of components of this system, and of other systems upon which the functioning of this system depends, shall be confirmed so that such devices can perform their role as components the Emergency Egress System. Other system components shall be installed to ensure a clear relation between devices of this system and the egress paths and spaces they serve. Where interference of components cannot be avoided by relocation of the component, provide a further component. Where such interference is brought to the Consultant's attention prior to installation of the interfering component or device, the Consultant will instruct regarding relocations or request additional work at Owner's expense. Where such interference is not brought to the Consultant's attention prior to installation of the interfering component, the Contractor shall provide relocation and /or additional component at no expense to the Owner.
11. The location of components of this system and other systems upon which it depends shall be confirmed by the Contractor with authorities having jurisdiction prior to installation.
12. The Contractor shall evaluate the classification of this facility and portions of the facility using the Ontario Building Code (OBC) matrix located on the architectural drawings, and shall inspect the OBC and applicable codes and regulations to ensure that the egress system design required by the Work is understood.
13. Definitions
  1. *Exits, access to exits, public corridors, means of egress, impeded egress zone, aisles, guards, and suites* are hereby defined in accordance with the definition of such terms in the Ontario Building Code, as if repeated here.

14. Pre-Installation System Workshop

1. Schedule during initial phases of project start-up a meeting with the Consultant to review and consider the means and methods proposed by the Contractor for installation of the systems, and to ensure that the location, intent, and requirements of the systems are clearly understood by the Contractor and Trade Contractors who will perform the work related to this system.

15. Sequencing

1. Plan and sequence work to permit installation of materials in conjunction with related materials so that the performance intent of the systems is achieved.
2. Provide emergency Egress Systems through all construction phases and maintain the system for all occupied portions of the Facility throughout the Contract Time. Pay for changes required to accomplish the systems at each stage of occupancy and the Work.

16. Submittals

1. Submit as described in Division 01:
  1. Acknowledgement to Consultant's satisfaction of review of submittals of other systems as they relate to this system.

17. Co-ordination and Quality Control

1. The Contractor's site superintendent shall be the System Commissioner for this System, and shall review all submittals of this and other work to ensure full understanding of the interrelation of components that will achieve the performance of the Emergency Egress Systems.
2. Inspection work and co-ordination work required to achieve the requirements of this Section are the responsibility of the Contractor's site superintendent and shall not be assigned to a trade contractor even if portions of the material or Product installation work are so assigned.

18. Reference Standards and Codes

1. Ontario Building Code requirements for continuous and complete emergency egress pathways, means of egress, and exits shall be achieved throughout the Facility, both during construction and in the completed facility.

19. Requirements For Temporary Facilities, Safety And Environment

1. Conform and cooperate to ensure requirements for temporary facilities, safety, cleaning and waste management, and environment as set out in Section 017010 and Divison 01 are achieved throughout the course of the Work. Provide an appropriate Emergency Egress System for the personnel performing work of this Contract, including Confined Space designs, scaffolding designs, and other designs where required to ensure the safety of such personnel.

20. Commissioning and Performance Verification Requirements

1. Perform commissioning requirements in according with Divison 01 and Section 018010 requirements to verify the proper performance of components of the system, and the system.

## 21. Identification of Building Systems

1. In addition to the Emergency Egress System, the work described by this Section is related to the other Building Systems as defined in Section 019010 and discussed elsewhere in this Section. Comply with requirements for performance, review, and co-ordination of such relations as set out in that Section.

## 2. PRODUCTS AND EXECUTION

1. Supply and installation of components of the emergency egress system are described in related sections and divisions of the specification, in schedules, and on drawings. In general, the system is accomplished by the proper co-ordination of work to other systems required by the Work, and by temporary measures provided in accordance with the requirements of Division 01.
2. General
  1. Execute work as described herein and as necessary to achieve performance.
  2. Co-ordinate work described elsewhere in the Contract to ensure complete and continuous systems to achieve Ontario Building Code objectives for egress and occupant safety throughout the construction period and in the finished Work.
  3. Provide appropriate temporary detection and alarm, signage, emergency lighting, and exit signage to maintain the Emergency Egress System during all phases of the Work.
3. Examination
  1. Examine work to other building systems to ensure conditions are satisfactory to achieve the performance standards for the design intent of this system.
  2. Schedule installation of components and other systems in strict accordance with sequencing requirements to achieve performance.
  3. Installation of Components
    1. Requirements for installation of products that form components of the Emergency Egress Systems are described in related sections and divisions of the specification, in schedules, and on drawings. This includes, but is not limited to:
      1. doors and frames, for clearances and protective functions,
      2. interior partitions and wallboard work, including clearances and related fire protection
      3. interior lighting and emergency lighting, for necessary light levels
      4. emergency lighting system for egress exit signage
      5. fire detection and alarm system, for electro-magnetic device control
      6. clearance within floor areas for aisles and code-mandated clear widths within occupied areas.
    2. Install components to meet requirements of the systems and construction of which they form part, and additionally to produce the required performance for the Emergency Egress System.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 01, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.
2. The Contractor is specifically cautioned that the Work requires performance of related services to assist the achievement of the performance objectives for this building system, as described in Section 019010 and this Section. The Contractor shall organize provision of the components of this building system to achieve the intent of the building system design, and shall provide all products and execution reasonable inferable as necessary to achieve the performance objectives and intent of the design.
3. The Contractor and more particularly the Superintendent shall thoroughly review all Sections of the specifications and all drawings, to ensure that the contract requirement for provision of a complete and functioning Fire Separation System throughout the Work is achieved where such systems are identified on drawings or in the specification.
4. The following components of the Fire Separation System are additionally described elsewhere:
  1. Concrete Work Division 03
  2. Masonry Work Division 04
  3. Rough Carpentry Work Section 061000
  4. Fire Protection components of Environmental Separation Systems Section 070500
  5. Fire and Smoke Protection Systems Section 078400
  6. Openings Division 08
  7. Wallboard Components of rated assemblies Section 092000
  8. Fire Protection Components of Plumbing Divisions 20 and 22
  9. Fire Protection Components of Air Distribution System Divisions 20 and 23
  10. Fire Protection Components of Electrical Systems Divisions 26 thru 28
5. The following related systems and components of related systems provide inputs to and receive outputs from the Fire Separation System. They are described elsewhere as noted:
  1. Emergency Egress System, receiving protection to pathways Section 019521
  2. Components of Assemblies, providing input to this system as described above
  3. Building Structural System, where receiving fire protection Section 019550
  4. Mechanical and Electrical Systems, component protection Divisions 20 through 28
6. The Fire Separation System indirectly affects the following systems described elsewhere:
  1. Emergency Egress System (site components)
  2. Facility Water Distribution System
7. System Intent
  1. **The intent of the Fire Separation Systems is to achieve continuous and effective separation, containment, and resistance to the spread of fire and smoke or the effects of fire and smoke in the building and beyond, through the installation of ULC-tested and OBC-approved assemblies that are specific to the location and materials used to achieve this performance.**
  2. **The Fire Separation Systems are existing to be made good.**
  3. **The Work shall include the making good of existing horizontal fire separations, by repair of existing rated wallboard membranes with new wallboard membrane patches, where existing membranes have been damaged by water ingress or leaks from existing services.**

4. **The Work shall include the fire-stop of all penetrations through existing rated assemblies, whether existing or new, to ensure continuity of the fire resistance ratings of assemblies is maintained.**
5. **The Work shall include new components and new assemblies to meet the performance objectives for new fire separations as indicated.**
8. In general, the Fire Separation System includes, but is not limited to, assemblies of installed Products and materials that consist of the following components:
  1. Surface finish materials and fire-resistive membranes barrier materials to resist the spread of fire, smoke, and gases (existing to be made good, and new by this Contract);
  2. Support elements and connections to building structure to hold resistive membranes in place during fire events, including against expansion, pressure, and other forces that will be experienced by the assemblies during a fire event (new by this Contract);
  3. Connections of membranes, smoke control devices and materials, and fire-stopping at perimeters of the system, to ensure continuity of the assemblies (new by this Contract);
  4. Closures with fire protection ratings to protect openings in assemblies (new by this Contract);
  5. Fire-stopping, fire dampers, and devices with test ratings to protect penetrations of the assemblies ( existing for alteration and provided new by this Contract).
9. The routing of the pathway components of this building system and the requirements of this system shall take the precedence of all other building systems in accordance with ULC assembly tests and certifications of installation requirements, where interference with proposed routing or other systems is encountered in the Work or in relation to existing conditions. Accommodate components of this system in laying out new or relocated portions of other systems.
10. The location of components of this system, and of other systems upon which the functioning of this system depends, shall be confirmed so that the components can perform their role in the Fire Separation Systems. Other system components shall be installed to ensure a clear relation between those components and the functions they serve as components of this system. Where interference of components cannot be avoided by relocation or sequencing, provide a further component. Where such interference is brought to the Consultant's attention prior to installation of the interfering component or device, the Consultant will instruct regarding relocations or request additional work at Owner's expense. Where such interference is not brought to the Consultant's attention prior to installation of the interfering component, the Contractor shall provide relocation and/or additional components at no expense to the Owner.
11. The location of components of this system shall be confirmed by the Contractor with authorities having jurisdiction prior to installation.
12. The Contractor shall evaluate the classification of this facility and portions of the facility using the Ontario Building Code (OBC) matrix located on the architectural drawings, and shall inspect the OBC and applicable codes and regulations to ensure that the fire separation system design is understood.
13. Definitions
  1. Note that a *fire separation* may have a *fire-resistance rating* or not (so-called smoke separation). Ratings of separations are in accordance with accepted ULC test assemblies and other methods as set out in the Ontario Building Code.
  2. *Firewall*, *fire separation*, *opening*, *closure*, and *fire-resistance rating* are hereby defined in accordance with the definition of such terms in the Ontario Building Code, as if repeated here.

14. Pre-Installation Conference

1. Schedule during initial phases of project start-up a meeting with the Consultant to review and consider the means and methods proposed by the Contractor for maintenance of the existing systems through the construction period, installation of the systems, and to ensure that the location, intent, and requirements of the systems are clearly understood by the Contractor and Trade Contractors who will perform the work related to this system.

15. Sequencing

1. Plan and sequence work to permit installation of materials in conjunction with related materials so that the performance intent of the systems is achieved. Such requirements shall have primary precedence over all other construction sequences.
2. Trades shall strictly conform to sequencing requirements for Fire Separation Systems.

16. Submittals

1. Submit as described in Division 01:
  1. Acknowledgement to Consultant's satisfaction of review of submittals of other systems and components as they relate to this system, by the Superintendent.
  2. Prior to ordering materials submit evidence of conformance of materials to ULC requirements for system components.

17. Co-ordination and Quality Control, System Commissioner

1. The Contractor's construction superintendent shall be the System Commissioner for this System. He or she shall review submittals of this and other work to ensure full understanding of the interrelation of components that will achieve the performance of the Fire Separation Systems.
2. Inspection work and co-ordination work required to achieve the requirements of this Section are the responsibility of the Contractor's site superintendent and shall not be assigned to a trade contractor even if portions of the material installation work are so assigned.

18. Reference Standards and Codes

1. Ontario Building Code requirements for continuous and complete fire separation assemblies, firewall assemblies, and fire-resistance ratings shall be achieved to all locations noted for such assemblies.
2. All assemblies shall be constructed to conform to a ULC test certification or other certification such as CSA, UL, NFPA, or FM as accepted under the Ontario Building Code and by authorities having jurisdiction.

19. Requirements For Temporary Facilities, Safety and Environment

1. Conform and cooperate to ensure requirements for temporary facilities, safety, cleaning and waste management, and environment Division 01 are achieved throughout the course of the Work. Provide an appropriate Fire Separation System for the personnel performing work of this Contract, where required to ensure the safety of such personnel.
2. Protect the existing building and the improvements by installing hoarding and partitions as fire separations early in the planning of the Work, so as to contain the spread of fire during any construction fire event.

3. Ensure existing systems of fire separation are maintained and protected from effects of the Work, so that the existing facility has a continuously functioning Fire Separation System. Design and provide alternative components to the system where required by the organisation of the ways and means for performing the Work at no further cost to the Owner. Minimise such disruptions wherever possible in the planning of the Work.

20. Commissioning Requirements

1. Perform commissioning requirements in accordance with Section 018010 requirements to ensure the proper function of components of the system, and the system.
2. Fire dampers shall be tested and reports submitted.
3. The System Commissioner shall inspect the progress of the installation of the components of the system, and shall submit reports and logs of such inspections.

21. Identification of Building Systems

1. In addition to the Fire Separation System, the work described by this Section is related to the other Building Systems as defined in Section 019010 and discussed elsewhere in this Section. Comply with requirements for performance, review, and co-ordination of such relations as set out in that Section.

## 2. PRODUCTS AND EXECUTION

1. Products and execution for components of fire separation systems are described in related sections and divisions of the specification, in schedules, and on drawings.
2. Examination
  1. Examine all existing visible portions of fire separations and all existing assemblies having a fire resistance rating, and include for all work to remove, repair, patch and fire-stop, wheresoever the existing rated membranes have been damaged, compromised, are loose, or otherwise fail to perform.
  2. Examine supports, substrates and work to other building systems to ensure conditions are satisfactory to achieve the performance standards for the work of this Section.
  3. Commencement of the work shall imply acceptance of conditions.
  4. Schedule installation of components in strict accordance with sequencing requirements to achieve ratings and performance.
3. Execute work as described herein and to achieve performance.
4. Co-ordinate work described elsewhere in the Contract to ensure complete and continuous systems to achieve Ontario Building Code objectives for fire protection and occupant safety.
5. Install products to form components of assemblies to conform with ULC approved test assemblies.
6. Provide work to perimeter of assemblies and penetrations of assemblies to conform to OBC requirements and ULC approved tests for fire-stopping and closures to openings in assemblies.
7. Firewall Assemblies: None Existing. None Proposed
8. Fire Separation Assemblies are to be located where indicated on the drawings. This Contract requires thorough examination of existing conditions and provision of all fire-stopping work to remedy deficiencies in the existing fire separations:
  1. to surround all OBC-defined *Exit* facilities;

2. to surround all OBC-defined Public Corridors;
3. to separate rooms and other spaces from the remainder of the building as required by Code or at the Owner's option, including but not necessarily limited to:
  1. to surround of all shelter rooms used for sleeping, including assemblies separating such rooms from corridors, as well as from each other;
  2. to surround and separate the existing Sleeping Room (Room no.M107) from all rooms in adjacent floor areas, including ground floor areas;
  3. to completed surround of all janitorial rooms;
  4. to surround of service rooms and storage rooms, where indicated on drawings; and
4. to surround and isolate service spaces including ceilings, from other spaces (required by this Contract); and
5. to separate multiple occupancies from one another (required by this Contract), including subsidiary uses from the main Group C Women's Shelter use.
9. Fire Resistance Assemblies may be required at the following locations:
  1. To exterior enclosure locations, including wall, roof, and overhanging floor assemblies, to provide fire resistance for exposing building face purposes to other property or buildings or portions of the building in accordance with OBC requirements.
  2. To protect building structure or components of other systems from the effects of fire (required by this Contract).
  3. To protect combustible elements of building systems, such as roof membranes, insulation, or other materials (required by this Contract).
  4. To control combustibility and smoke generation of materials in case of fire (required by this Contract).
  5. To separate ceiling spaces into fire compartments in conjunction with work to fire separation partitions, so that the fire separation extends from floor level to underside of floor structure over or to roof deck, as the case may be (required by this Contract).
  6. To separate basement floor areas, attic spaces, or other floor areas into maximum allowable fire compartment areas (required by this Contract)
  7. To establish protected refuge areas where required by the design (required by this Contract).
    1. The existing main circulation stair is a defined area of refuge for those requiring assistive mobility devices.
10. Penetrations of Assemblies
  1. Ensure penetrations through the fire separation systems are protected in accordance with performance requirements, ULC tested assembly requirements, as described in related Sections, and as indicated on drawings.
  2. Fire-stopping, fire dampers, protection collars to piping, and other protections as required by Code shall be installed in a timely fashion, and with access and clearances so that they may be inspected by authorities and maintained by the Owner.
  3. Ensure sizes of openings without protection conform to Code restrictions.

4. Ensure penetrations of wiring and small piping are bundled within neat sleeves to facilitate proper allowance for movement and conformance with referenced smoke seal and fire-stopping designs.
11. Protection of Openings in Assemblies
  1. Ensure openings in assemblies are protected using closures installed in accordance with NFPA and ULC tests or otherwise as prescribed by the governing building and fire codes.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 01, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.

### 2. Related Requirements

1. The Contractor is specifically cautioned that the Work requires achievement of the performance objectives for building systems described in Section 019010 and this Section. The Contractor shall organise the provision of the components of building systems to achieve the intent of the building system design, and shall provide all products and execution reasonably inferable as necessary to achieve the performance objective.
2. The Contractor shall perform the installation work to meet performance requirements for quality of work and installation tolerances as set out in Section 017010.
3. The Contractor, and more particularly the Superintendent, shall thoroughly review all Sections of the specifications, and all drawings, to ensure that the requirements for execution of complete and functioning Barrier-free Path of Travel Systems throughout the Work to locations where such systems are identified on drawings or in the specification.
4. In general, barrier-free path of travel systems consist of the following components:
  1. Sloped floors, ramps and handrails, elevators and lifts, and other assistive devices of appropriate size and configuration necessary to achieve transitions between levels within or outside the Facility in compliance with
  2. specific points of transition among different surfaces and levels (for instance curb cuts in sidewalks) and detection devices such as tactile strips and deliberate colour contrast at transitions from floor to wall or area to area
  3. specific considerations for clearances at doors and openings, together with operational hardware suitable for accessibility
  4. Appropriate light and auditory levels that maximize perception of the environment
  5. accessible washroom, shower, and similar facilities for users of Barrier-free areas, with assistive devices and consideration for location of accessories and aids
  6. Parking spaces, drop-off areas, and pathways of appropriate width, gradient and surface finish, with appropriate signage and markings
  7. Characteristics for surface finishes in the Interior Finish System and the Exterior Grading and Drainage System, including slip-resistance, colour and contrast
  8. Appropriate height and configuration of switches, counters, millwork, and other similar device, finish and equipment elements to ensure accessible use
5. Requirements for the components of barrier-free path of travel systems are additionally described in the following sections:

1. Existing Conditions	Section 002000
2. Cast-in-Place Concrete	Section 033000
3. Masonry Work	Division 04
4. Metal Fabrications	Section 055000
5. Rough Carpentry	Section 061000
6. Finish Carpentry	Section 062000

7. Architectural Woodwork	Section 064000
8. Openings	Division 08
9. Finishes	Division 09
10. Washroom Accessories	Section 102800
11. Plumbing Fixtures and Trim	Division 22
12. Electrical Connections to Hardware	Division 26
13. Interior Lighting System	Division 26
14. Site Grading and Surface Drainage System	Section 312200
15. Exterior Finish of Concrete Surfaces and Work to Curbs	Section 321600

6. **The system is existing, and shall be maintained for all occupied portions of the Facility throughout the Contract Time.**
7. **The system shall be extended throughout existing floor areas, and constructed in the Work to meet new standards and the requirements of this Contract.**
8. **No existing condition in the Facility shall reduce or alleviate a contract requirement for the work to provide all new portions of the Barrier-Free Path of Travel System.**

### 3. Definitions

1. *Barrier-free* is hereby defined in accordance with the definition of such terms in the Ontario Building Code (OBC) and the Ontarians with Disabilities Act (AODA), as if repeated here.
2. *Accessible* is hereby defined as being in accordance with the City of Waterloo Built Environment Standard.

### 4. System Intent

1. The intent of the Barrier-free Path of Travel Systems is to ensure that the building and its facilities, either in whole or in part are accessible to persons with the widest range of physical or sensory abilities. The systems are existing in the Facility, and require modification and installation of new products and components to alter the systems. Where systems are located in portions of the Facility that are not otherwise affected by the Work, existing barrier-free paths of travel shall remain without alteration.
2. The Barrier-free Path of Travel System may include the following, either singly or in combination:
  1. Clear Widths
  2. Mounting Heights
  3. Ease of Use
  4. Colour and Surface Contrasts
  5. Dedicated Equipment or Assistive Devices
3. Clear Widths and Mounting Heights
  1. Requires the construction of a work of this contract with due regard for finished clear widths and mounting heights of items and elements so that users may pass with clearances and reach items as set out in the OBC Barrier Free regulations. Do not proceed in uncertainty.
4. Ease of Use
  1. The Work shall be performed so that installation of elements of the Work results in greatest ease of use, regardless of ability. Do not proceed in uncertainty.
5. Pre-Installation System Workshop

1. Schedule during initial phases of project start-up the Contractor shall convene a workshop session with the Consultant to review and consider the design and its intent, and the means and methods proposed by the Contractor for installation of the systems. The Contractor shall ensure that the location, intent, and requirements of the systems are clearly understood by the Superintendent, and all Trade Contractors who will perform aspects of the Work related to this System.
6. Sequencing
  1. Plan and sequence work to permit installation of materials in conjunction with related materials so that the performance intent of the systems is achieved. Trades shall strictly conform to sequencing requirements for the Barrier-Free Path of Travel System. Such requirements shall have primary precedence over all other construction sequences.
  2. Provide Barrier-free Path of Travel Systems through all construction phases and maintain the system for all occupied portions of the Facility throughout the Contract Time. Pay for changes required to accomplish the systems at each stage of occupancy and the Work.
7. Submittals
  1. Submit in accordance with Division 01 requirements:
    1. Prior to ordering materials submit evidence of conformance of materials to OBC requirements for system components in Barrier-Free Paths of Travel.
8. Co-ordination and Quality Control
  1. The Contractor's Site Superintendent is deemed to be the System Commissioner for the Barrier-free Path of Travel System, and shall review submittals of this and other portions of the Work to ensure the provision and interrelation of components that will achieve the performance of the Barrier-Free Path of Travel Systems.
  2. Inspection work and co-ordination work required to achieve the requirements of this Section are the responsibility of the Contractor's Superintendent and shall not be assigned to a trade contractor even if portions of the material installation work are so assigned.
9. Reference Standards and Codes
  1. Ontario Building Code requirements for continuous and complete Barrier-free Path of Travel shall be achieved to all locations noted for such assemblies within areas of the Facility affected by the Work.
  2. Compliance with the Accessibility for Ontarians with Disabilities Act (AODA) forms the basis of the minimum performance requirement for this System.
10. Commissioning and Performance Verification Requirements
  1. Perform commissioning requirements in according with Division 01 and Section 018010 requirements to verify the proper performance of components of the system, and the system.
  2. Acceptance of system shall be to satisfaction of Owner, Consultant, and OBC Building Official.
11. Identification of Building Systems
  1. The work described by this Section is related to the following Building Systems as defined in Section 019010. Comply with requirements for performance, review and co-ordination of such relations, including but not limited to:

1. Emergency Egress System
2. Fire Separation Systems
3. Environmental Separation Systems
4. Interior Finishing Systems
5. Mechanical Plumbing Systems
5. Interior and Exterior Lighting Systems
6. Fire Detection and Alarm System
7. Communication Systems
8. Site Finishes System

## 2. PRODUCTS

1. Products for components of the Barrier-Free Path of Travel systems are described in related sections and divisions of the specification, in schedules, and on drawings.

## 3. EXECUTION

1. General
  1. Execute work as described herein and to achieve performance.
  2. Co-ordinate work described elsewhere in the Contract to ensure a complete and continuous Barrier-free system to areas affected by the Work to achieve Ontario Building Code requirements and AODA objectives for accessibility.
  3. Install products to form components of the system that conform with local authorities requirements for accessibility, where such requirements exist. Achieve City of Waterloo standards for accessibility measures.
2. Examination
  1. Commencement of the work shall imply acceptance of conditions. Examine existing conditions carefully. Do not proceed in uncertainty.
3. Installation of Components
  1. Requirements for installation of products that form components of the Barrier-Free Path of Travel Systems are described in related sections and divisions of the specification, in schedules, and on drawings. This includes, but is not limited to:
    1. doors, frames, and hardware, for clearances and assistive operation functions,
    2. interior finishes work, including clearances and related surface characteristics
    3. interior lighting and emergency lighting and control, for necessary light levels
    4. devices of other Systems, for accessible mounting heights
    5. clearance within floor areas for aisles and code-mandated clear widths within occupied areas
    6. site finishes and signage
    7. construction of assistive elements for changes in level, including associated handrails and curbs
    8. accessible sanitary devices and equipment and millwork components related to occupant use of the Facility.
  2. Install components to meet requirements of the systems and construction of which they form part, and additionally to produce the required performance for the Barrier-Free Path of Travel System.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 01, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.
2. The Contractor is specifically cautioned that the Work requires performance of related services to assist the achievement of the performance objectives for this Building System, as described in Section 019010 and this Section. The Contractor shall organize provision of the components of this Building System to achieve the intent of the Building System design, and shall provide all products and execution reasonable inferable as necessary to achieve the performance objectives and intent of the design.
3. The Contractor shall thoroughly review all Sections of the specifications and all drawings, to ensure that the contract requirement for provision of a complete and functioning Building Structural System throughout the Work is achieved where such systems are identified on drawings or in the specification.
4. The following components of the Building Structural System are additionally described elsewhere:
  1. Existing Conditions Division 02
  2. Contributions to structure by concrete Division 03
  3. Contributions to structure by masonry Division 04
  4. Contributions to structure by steel Division 05
  5. Contributions to structure by wood Division 06
  6. Contributions to structure by Metal Fabrications Section 055000
5. The Building Structural System provides physical support to all other components Building Systems, as set out herein. In certain instances Building System components may be physically supported by other Building Systems or components, which in turn are supported by the Building Structural System. In general, all conduits, pipes, ducts, equipment, and accessories and devices weighing in excess of 20 kg. must be supported directly from the building structural system unless specifically permitted in the specification. All other building and system components, must be installed to ensure their support is provided by the Building Structural Systems.
6. Certain components of systems must be supported directly from the Building Structural Systems by code, regulation, manufacturer's recommendation, or authority having jurisdiction. The Contractor shall ensure that such support is provided.
7. The Building Structural System indirectly affects the following systems described elsewhere:
  1. Finishes (Division 09)
  2. Site Grading & Drainage System (Division 32)
  3. Thermal and Moisture Protection (Division 07)
  4. Mechanical Equipment and Systems (Divisions 20 through 23 inclusive)
  5. Electrical Equipment and Systems (Divisions 26 through 28 inclusive)
  6. The Barrier-free Path of Travel Systems (support for adult change table and grab bars) Section 019030)
  7. Roof Accessories (Section 077200) for Roof Anchors
8. System Intent
  1. The system is existing to remain, for minor alteration for new openings for mechanical duct penetrations, and minor modifications to framing.

2. Notwithstanding the above, the intent of the Building Structural System is to permanently, safely, and effectively anticipate and receive the transfer of all existing dead and live loads and forces from other Building Systems – whether existing or new - and from the structural system itself. All loads and forces are transferred to founding soil as an output of the system. The system shall have existing structural capacity and structural integrity at all points within the system components to resist the received loads, the effects of the loads and influences that may reasonably be expected, having regard to the expected service life of the Facility. The system is existing, and requires addition and alteration by this Contract.
3. Components of other parts of the Work must be connected to the existing Building Structural System in such a way that loads to the existing system are within parameters for its existing performance capacity. Do not proceed in uncertainty. Clarify with the Consultant any part of the Work that may have potential to substantively change the capacity of the Building Structural System or to exceed component or overall system capacity.
9. The Building Structural System shall support the comfort and activity of the building occupants and their activities as may be anticipated, with due regard for the effects of movement, sway, vibration, and other effects that affect serviceability and occupant comfort.
10. The existing system is designed with existing expansion, contraction, deflection, movement, vibration and deformation under dead and live loads within tolerances. Additional parts of the Work shall be connected with due regard for such tolerances. All connections of the system to other systems and construction, and connection of system components themselves, shall be designed for such movement, so that no unintended loads are transferred when forces that may reasonably be anticipated are imposed.
11. The system allows for similar tolerances and movements of components of other systems, and connections of those other systems to the Building Structural System shall be constructed with due regard for such tolerances and movement, caused by forces that may reasonably be anticipated.
12. The Building's Structural System is designed to achieve Normal Importance Category in accordance with codes and regulations of the OBC.
13. **It is extremely important that construction activities do not impose loads on the system or any component that are not anticipated by the design of the system. The structural system is designed for the use and occupancy of the existing Conditions and the finished Work, not for loads caused howsoever by construction, or temporary loads that may be imposed on components during alteration of the existing structural systems adjacent or the construction of the new system.**
14. In general, the Building Structural System includes, but is not limited to, assemblies of installed Products and materials that consist of the following components:
  1. membrane components such as horizontal and vertical surfaces that gather live loads imposed by environmental forces, use and occupancy (such as slabs, decks, wall cladding, or similar), and dead loads. Such components may be part of other Building Systems, such as the environmental separation system, or provide direct membrane support to such systems.
  2. conductive resisting members that receive the loads imposed by such membranes at bearing points, organise and resolve the forces and effects created by the loads, and in turn pass the loads and effects to members designed to receive them and to the building foundation subsystem;
  3. a building foundation that receives the loads and the effects of the loads, and resolves and passes the loads safely and effectively to the supporting soil or rock, taking into consideration the characteristics of the ground into which the forces are transmitted and the environment of the site;

4. connecting components between members and from the system to components of other systems;
  5. component devices to dampen or reduce the effects of loads, and
  6. connections to other systems to receive the dead and live loads of such systems.
15. The routing of the pathway components of this Building System and the requirements of this system shall take the precedence of all other Building Systems unless measures are specifically anticipated in the structural design to accommodate the passage of another system. Where interference with proposed routing of other systems is encountered in the Work or in relation to existing conditions, accommodate the requirements of components of the structural system in laying out new or relocated portions of other systems.
16. The location of components of this system, and of other systems upon which the functioning of this system depends, shall be confirmed so that the components can perform their role in the Building Structural System. Other system components shall be installed to ensure a clear relation between those components and the functions they serve as components of this system. Where interference of components cannot be avoided by relocation or sequencing, provide a further component. Where such interference is brought to the Consultant's attention prior to installation of the interfering component or device, the Consultant will instruct regarding relocations or request additional work at Owner's expense. Where such interference is not brought to the Consultant's attention prior to installation of the interfering component, the Contractor shall provide relocation and/or additional components at no expense to the Owner.
17. The Contractor shall evaluate the classification of this facility and portions of the facility using the Ontario Building Code (OBC) matrix located on the architectural drawings, and shall inspect the OBC and applicable codes and regulations to ensure that the OBC-mandated loads and forces to which the Building Structural System design must respond are clearly understood. In no case shall the Contractor proceed in uncertainty. Contact the Consultant whenever clarification is required.
18. Definitions
1. Definitions of *live load* and *dead loads*, *effects of loads*, and other structural terms, shall be as set out in the Ontario Building Code and consistent with established engineering principles.
  2. For the purposes of this Contract, and only for the purposes of allowing the support of minor devices of Building Systems with flexible connections, non-loadbearing partitions and suspended ceiling systems may be considered as part of the Building Structural System, where constructed to receive the loads of such devices as allowed and set out in the Building Code. Maximum load shall not exceed 20 kg.
19. Pre-Installation Conference
1. Schedule during initial phases of project start-up a meeting with the Consultant to review and consider the means and methods proposed by the Contractor for installation of the systems, and to ensure that the location, intent, and requirements of the systems are clearly understood by the Contractor and Trade Contractors who will perform the work related to this system.
20. Sequencing
1. Plan and sequence work to permit installation of materials in conjunction with related materials so that the performance intent of the systems is achieved. Trades shall strictly conform to sequencing requirements for the Building Structural System. Such requirements shall have primary precedence over all other construction sequences.

21. Submittals

1. Submit as described in Division 01:
  1. Acknowledgement to Consultant's satisfaction of review of submittals of other systems as they relate to this system.
  2. Prior to ordering materials submit evidence of conformance of materials to meet capacity requirements for system components, by Shop Drawing or other Submittal as requested by the Consultant or in material specification sections.

22. Co-ordination and Quality Control

1. The Contractor's Superintendent is deemed to be the Building Systems representative and System Commissioner for this system, and shall review submittals of this and other work to ensure full understanding of the interrelation of components that will achieve the performance of the Building Structural System.
2. Inspection work and co-ordination work required to achieve the requirements of this Section are the responsibility of the Contractor's Superintendent and shall not be assigned to a trade contractor even if portions of the material installation work are so assigned.
3. Review by the Consultant and inspection by the Owner's inspection forces are for the Owner's quality control purposes, and do not relieve the Contractor of requirements for quality control.

23. Reference Standards and Codes

1. Ontario Building Code references and standards, and the references and standards set out in individual component specifications shall apply to the Building Structural System. Comply with such standards.

24. Requirements For Temporary Facilities, Safety and Environment

1. Conform and cooperate to ensure requirements for temporary facilities, safety, cleaning and waste management, and environment as set out in Division 01 are achieved throughout the course of the Work. Design and provide an appropriate structural system for the personnel performing work of this Contract, where required to ensure the safety of such personnel or by legislation governing the Work.
2. Ensure existing portions of the structural system are maintained and protected from effects of the Work, so that occupants of the existing facility have a continuously functioning Building Structural System. Design and provide alternative components to the system where required by the organisation of the ways and means for performing the Work. Minimise such disruptions wherever possible in the planning of the Work.

25. Commissioning Requirements

1. Perform commissioning requirements in according with Division 01 requirements to ensure the proper function of components of the system. This shall include inspection of existing parts of the system revealed during the course of the Work and Contract Time.
2. It is imperative that any suspected deficiency or defect in the existing Building Structural System that is revealed during the course of the Work is reported immediately to the Owner and Consultant. Where such defect may affect the safety of occupants or the workforce, take all measured required to ensure safety and limit access to any portion of the Facility that may be subject to such defect.

## 26. Identification of Building Systems

1. The work described by this Section is related to the other Building Systems as defined in Section 019010 and discussed elsewhere in this Section. Comply with requirements for performance, review, and co-ordination of such relations as set out in that Section.

## 2. PRODUCTS AND EXECUTION

1. Products and execution for components of Building Structural System are described in related sections and divisions of the specification, in schedules, and on drawings.
2. Examination
  1. Examine supports, substrates and work to other Building Systems to ensure conditions are satisfactory to achieve the performance standards for the work of this Section.
  2. Commencement of the work shall imply acceptance of conditions.
  3. Schedule installation of components in strict accordance with sequencing requirements to achieve installation and performance.
3. Execute work as described herein and to maintain performance of the existing System within its capacity. Do not proceed in uncertainty.
4. Co-ordinate work described elsewhere in the Contract to ensure complete and continuous systems to achieve Ontario Building Code objectives for the Building Structural System.
5. Install products to form components of the structural system to conform with requirements of reference standards and to permit movement only within tolerances allowed in the design. Install products and materials so that forces are transmitted as intended by the design, in all conditions of service in the life of the building.
6. Firewalls and Movement Joints. The Work:
  1. does not require firewall construction nor is there an existing firewall in the Facility.
  2. does not require an expansion joint in the system, nor is there an existing expansion joint in the area of the Facility affected by the Work.
7. Connections and Loads
  1. Ensure fasteners and connections among adjacent portions of the work are designed to transmit forces as intended, and within tolerances. Where movement of a system or component is required, such as expansion joints, design connections to properly transmit forces without compromising movement.
  2. Connections of interior partitions, ceiling assemblies, and similar components shall be to portions of the Building Structural System using appropriate fasteners and techniques that are selected by the Contractor to ensure their performance in transmitting loads.
  3. The Contractor is cautioned that no part of the Facility and Work is truly “non-loadbearing”. No industry practice or convention shall be accepted in such regard. All components and elements of the Work and Facility have weight, impose loads on other components, and receive live loads through use and occupancy. All elements of the Facility experience climatic factors associated with the Place of the Work (such as earthquake loads, wind loads, snow and rain loads, and similar) and must be constructed to transmit such loads to the Building Structural System in a safe and adequate manner. Such planned transfer shall include appropriate factors for safety and redundancy. Perform the Work with due regard for such transfer and overall structural performance of all elements of the Facility.

8. Durability

1. Components of the Building Structural System shall be installed with due regard for durability in the conditions of service.
2. Perform the installation work in accordance with Division 01 requirements for quality control and durability, utilizing principles of redundancy. Provide quality control and testing measures to ensure that materials, Products, and fasteners that are not subject to premature failure or manufacturing defect. Submit evidence of such quality control upon request.
3. The Environmental Separation System shall be installed to ensure protection of the structural system from effects that may reduce the capacity or performance of the system or its components through movement of the Structural System because of live loads.

**END OF SECTION**

## 1. GENERAL

Bidders are reminded that requirements for removals and select demolition is included in this Section but pertain to the work of all trade contractors and systems in the Work and existing Facility. All bidders shall inspect the Reference Documents as well as architectural, structural, mechanical, and electrical removals drawings and include all work and services identified or reasonably inferable from the Reference Documents and the drawings, Division 1 of the Specification, and this Section in the bid cost, Contract Amount, and design for accomplishment of the Contract Time.

### 1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated herein.
2. This specification section describes methods and standards. It is not a separate portion of the Work that shall be performed by either the Contractor's own forces or a single demolition trade. All items that are to be salvaged or refurbished for re-use in the finished Work or handover to the Owner shall be removed under the direction of the qualified trade contractor that will be refurbishing and re-installing the item or providing similar work in the Contract (for example, electrical), without exception.
3. The Contractor is specifically cautioned that the performance standards and skills required of all trades and Contractor's own forces performing demolition and removals work for salvage must be to the standard necessary for effective dismantling of items of the existing building and site, to maximise the possibility for re-use of such items with minimal refurbishment. This includes but is not limited to fixtures and fittings, luminaires, surface finishes, masonry units, and subsurface soils. Care must be taken with soils that stockpiles are made for each distinct type of finish and/or soil, and that stockpiles are not exposed to segregation.
4. The Contractor shall photograph all portions of the existing building and site extensively prior to beginning any removal or demolition, sufficient for later reference in the renovation of the facility. Label all salvaged components for location and reuse using methods that will not fade or fall off unless actively and purposely removed, to surfaces that will not appear in the finished Work.
5. The Work requires a thorough cleaning of the existing building to areas under the Contractors control, as described herein, as well as maintenance cleaning to portions of the existing storm water and sanitary sewerage system that will remain in the completed Work.
6. The Contractor shall include for all prices and work inferred by the Documents, in both base bid and supplemental pricing. This includes removal and demolition of existing portions of the Facility, building, or site that are necessary to perform work described by the Documents for both base bid and supplemental bid forms. No further costs will be considered for such work, as this work is included in the Contract Price, all bid prices, and the Contract Time.

### 2. Related Requirements

1. Selectively demolished and salvaged items shall be removed using standards of applicable sections of the specification that describe the building systems, material or product being demolished or salvaged. This includes compliance with Contract requirements in Division 1 and elsewhere for recycling of removed or demolished materials and products.
2. Undertake operations in strict conformance with the requirements of Section 017042 Construction Waste Management and Disposal and requirements of the OHSA and other applicable legislation. All removed and demolished items shall be recycled unless the Contractor can demonstrate that there is no recycling operation within 100 km of the Place of the Work that will accept the demolished item.

3. Further requirements for demolition and salvage of items for refurbishment and re-use in the Work are described in individual sections of the specification. The Contractor shall review such requirements and co-ordinate bidding so that all work required by the Contract is included, and priced once in a co-ordinated manner.
  4. Flushing and cleaning of existing systems such as sanitary sewerage, storm sewerage, and similar, is described in Division 33 sections for such systems, and on drawings.
  5. Selective demolition of base and sub-base material below concrete slabs-on-grade is required. Contractor shall review and co-ordinate all such demolitions with existing structural, mechanical and electrical conditions. Under no circumstances shall selective demolition of bases be undertaken such that existing structural foundations or pipe beds in use are undermined or have the risk of being undermined through new exposure or impact.
  6. Selective demolition and/or salvage of mechanical or electrical systems and components is also described in the mechanical and electrical Documents.
3. Notices of Interruption and Organization for Minimal Disturbance
    1. Notify Consultant and obtain Owner acceptance before each disruption of site access or services, or existing building systems. Co-ordinate all interruptions for minimal disturbance and as necessary to conform to the required Sequence of Construction and the Owner's Operations, Safety, and Security Conditions.
  4. Definitions
    1. The word "*remove*" or "*demolish*", where appearing in the Documents, means: to provide any shoring and temporary measures required for safety; to demolish in accordance with the selective demolition procedure established by the Contractor in accordance with all applicable law; to remove and recycle all material, dispose of all debris and to make good existing surfaces adjacent and in the area of the removal to match conditions prior to removal. In addition to removals of specific items, Site Grading, and Excavation are forms of removal, and are further described in other Sections of Division 31 and 32.
    2. The word "*salvage*", where appearing in the Documents, means to remove for the purposes of re-use. It includes, but is not limited to, taking necessary steps to remove and store fasteners and to maintain salvaged material in good condition for re-use. Where necessary, demolish around salvaged material as required in order to maintain the salvaged material in good condition upon removal, and make good such damage to existing conditions. Salvaged soils for stockpiling and use in this Contract if allowed by Contract provisions, or for Owner's later re-use shall be carefully constructed to minimize segregation and intermixing of different soil types unless specifically noted for blending prior to re-use.
  5. Scope of Work for Demolishing and Salvaging of Existing Elements
    1. Selective Demolition includes but is not limited to the following:
      1. all work indicated on Removals and Demolition Drawings, wheresoever located;
      2. all cutting and patching to accomplish other aspects of the Work, whether indicated on drawings or not, including as necessary to install new work in existing ceiling, slab, floor, wall, or partition spaces, with restoration of same;
      3. all removals required for temporary relocation of items during construction;
      4. all mechanical and electrical removals and relocations required to accomplish the Work, including relocations of existing power, water, telephone and data where such items are to remain functional during the Contract Time and/or the finished Work;
      5. all removals required to facilitate installation of new drainage patterns, services, utilities, or new finishes in the Work.

2. Removal of items and selective demolition includes associated wiring, conduit, piping, controls, bedding, and accessories located in the area or connected to such items, with appropriate decommissioning and removal back to nearest branch point of the system, unless specifically noted otherwise.
  3. The drawings show the general intent of demolition and salvage of existing elements to accommodate the intended work of this Contract and the work of future contracts in the Project. Further and specific performance criteria for this demolition and salvage or disposal are indicated in this specification section and in specific sections associated with the discipline of work or building system affected by the removals.
  4. All costs for temporary protection, mobile equipment, platforms, or other measures required to effect the demolition, maintain public and worker safety, and salvage or disposal are included in the Contract Price.
  5. Demolition and salvage or disposal shall be undertaken to suit the required schedule for completion and the required sequence of construction. Note that removals and selective demolition shall occur in strict accordance with the required Sequence of Construction, and may require multiple mobilization to the site and restoration of areas during the Construction Period. Pay all costs and include all work required to achieve the intent of the Sequence of Construction. Immediately upon completion of demolition or removals the area shall be readied for the next phase of the Work and new work installed.
  6. Disconnect and protect existing services and systems using methods described in Mechanical and Electrical drawings and specifications and as necessary for the Work. Salvage all devices and wiring, including fibre optic cabling, where identified for re-use or delivery to the Owner.
6. Schedule of Items
1. Co-ordinate the work to ensure that all required selective demolition is performed and included in the bidding and contract price. The following list of items required for demolition is not complete. Review the documents and provide all removals necessary for the Work.
  2. Remove and demolish and dispose of the following:
    1. All items required for cutting to achieve new below slab services.
    2. All removals of electrical and mechanical systems except where indicated for re-use or alteration, and as required to maintain feeds to the existing Facilities.
  3. Salvage the following for refurbishment and re-use:
    1. All equipment, all miscellaneous metal items indicated for re-use in the Work
    2. Fill materials, only to the extent re-use of same is permitted as described in Divisions 31
    3. Devices, structures, wiring, piping and conduit in the existing services where such elements may be proposed for re-use in the Work by credit to the Contract Price, unless the item is specifically noted for re-use in the Work.
    4. All electrical and mechanical devices within demolished areas of existing building, for handing over to the Owner or disposal as the Owner may decide
    5. Acoustic panels of existing suspended lay-in ceiling systems, for spot replacement of stained or damaged panels in existing ceilings scheduled to remain and/or for modification.
  4. Removal of items includes associated wiring, conduit, piping, controls, and accessories unless noted otherwise. Demolition of partitions and ceilings includes demolition of all items located within same, and tie-off and removal of redundant feeds, supports, and lines.
  5. Provide all removals, relocations, and re-installations required to facilitate work to the existing structural system of the building, whether below grade, at grade or floor or roof level. This includes removal of adjacent elements of the existing facility, building, or site that require removal to facilitate further work to the existing structure or building.

7. Scope of Work for Cleaning of Areas of Existing Building Affected by the Work

1. The work described by this Section includes for a thorough cleaning of all surfaces in the existing buildings that are adjacent or part of areas receiving select demolition, that will be exposed in the finished Work. As such, it is expected that cleaning operations will be undertaken initially to remove all dust, grease, sediment, deposits, and grime from surfaces within or on the building whether in former ceiling spaces or in occupied levels of the building, **immediately upon completion of select demolition activities**. Surfaces include, but are not limited to:
  1. All interior slab, floor, wall and ceiling surfaces within areas under the control of the Contractor and where such surfaces have been affected by the Work.
  2. All costs for consumables, temporary protection, electrical shutdowns and temporary lighting, mobile equipment, platforms, or other measures required to effect the cleaning are included in the Contract Price.
  3. The cleaning described by this Section is distinct from construction and final cleaning described in Division 01, and shall not be undertaken as the same operation as final cleaning prior to handover to Owner. Additionally and further, upon Substantial Performance of the Work all areas of the completed work, including existing areas to remain and for alteration, shall be free of accumulated dust and grime, and clean, in accordance with Division 01 requirements.

8. Submittals

1. Submit as described in Division 1:
  1. Submit design calculations and structural drawings for shoring and underpinning before proceeding with demolition or breaking out of load bearing walls or other structural elements requiring shoring. Provide to authority having jurisdiction shoring and underpinning drawings prepared by qualified professional engineer registered or licensed in the province of Ontario showing proposed method.
  2. Submit a description of proposed cleaning methods for the various aspects of cleaning required by this Section, including proposed products used and methods of disposal.

9. Reference Standards

1. Comply with National Building Code, Part 8, Construction Safety Measures at Construction and Demolition sites, and Provincial requirements.

10. Basic Execution Requirements

1. Protection
  1. Prevent movement, settlement, or other damage to adjacent structures, utilities, and parts of building to remain in place. Provide bracing and shoring required.
  2. Protect building systems, services and equipment.
  3. Provide temporary dust screens, covers, railings, supports and other protection as required, including protection of electrical devices and equipment from operations.
2. Caution
  1. All work to exterior portions of the building must use means and equipment that will not damage existing landscaping, concrete or asphalt surfaces to remain in the finished Work. Sequence the operations, provide temporary protection, and route all vehicles so that use of existing soft landscape areas for traffic is eliminated. Make good all damage to Existing Conditions at no expense to the Owner.

## 11. Identification of Building Systems

1. The work described by this Section and selective demolition described in other sections is related to the following Building Systems as defined in Section 019010. Comply with requirements for performance, review, and co-ordination of such systems:
  1. Emergency Egress System
  2. Fire Separation Systems
  3. Barrier-Free Path of Travel System
  4. Building Structural System
  5. Environmental Separation Systems; floor, roof, wall and curtainwall subsystems;
  6. Interior Finish Systems
  7. Mechanical and Electrical Systems, Communication and Security Systems

## 2. PRODUCTS

1. Products and Materials for Selective Demolition and Cleaning
  1. It is the intent of this Section that selective demolition and cleaning operations, including removal of finishes from existing substrates for refinishing in the Work, shall employ methods, materials and products that are safe, non-toxic, substantially odourless, and designed for minimal dust generation. Do not use invasive or harsh products that may harm adjacent elements, existing items or elements for re-use, or create waste for disposal that is designated as a result of the use of such potentially toxic or designated materials or substances.
  2. All slab grinding, cutting of slabs, and cutting or coring of masonry or concrete shall be with wet-cut methods and shall use equipment with protective shields and vacuum attachments.

## 3. EXECUTION

1. Preparation
  1. Confirm, disconnect and re-route service lines entering areas and portions of the site to be selectively demolished. Post warning signs on electrical lines and equipment that must remain energized to serve other areas during period of demolition. Call for locates and perform locates as necessary to determine existing systems, including x-ray of floor slabs for areas of slab cutting. Pay all costs for this work.
  2. Disconnect and cap designated services within the area for selective demolition:
    1. Electrical supply lines: remove in accordance with electrical code requirements, for alterations to systems
    2. Sanitary and water lines: remove as required for alterations to systems.
  3. Do not disrupt active or energized utilities designated to remain undisturbed.
  4. Owner will not remove all loose furnishings to areas for selective demolition in the Second and Third storeys prior to handing over the area to the Contractor. The Contractor shall protect existing from damage during the course of the Work.
  5. Areas of the Facility that are to receive select demolition but are generally to remain occupied must be fully protected from dust and noxious fumes, with dust-proof partitions sealed to the slabs and underside of deck above, or similar methods acceptable to the Owner and Tenant.
  6. Select demolition of exterior enclosure assemblies (floor, roof, wall, or otherwise) shall only be commenced after acceptance of protective measures for temporary maintenance of enclosure performance against rain, snow,, and moisture ingress. Provide temporary exterior and enclosure finishes to ensure that existing building is not adversely affected after demolition and

before application of new enclosure assemblies or re-installation of existing assembly components.

2. General

1. Perform the stipulated demolitions of the existing site and building in strict accordance with the required Sequence of Construction and to achieve the Construction Schedule requirements.
2. At end of each day's work, leave work in safe, weathertight, and stable condition.
3. Remove all materials using forces knowledgeable and qualified to undertake work on the particular item being removed. Co-ordinate removals to minimise interferences amongst the items, and remove and re-install at no cost to Owner those items that must be temporarily removed to gain access to items required to be demolished.
4. Confirm and layout locations and extent of selective demolition prior to performing same.
5. Perform selective demolition with due care for item to be salvaged. Store items for re-use or to be delivered to Owner away from the weather in a secure location where they will not be damaged. The Contractor shall make good any damage at its own expense.
6. Perform all selective demolition work identified on the Drawings and in this Section.
7. Perform all selective demolition work required to adapt existing conditions to the finished requirements of the work, whether explicitly shown in removals drawings, elsewhere in the documents or not, where such work may be reasonably inferred as necessary to accomplish the finished Work described by the Documents. This includes partial removal and reinstallation of ceilings, suspension systems, and similar as are necessary to facilitate installation of piping, ducting, conduit or to accommodate lifts for access to ceiling spaces and work.
8. All equipment, products and fixtures removed become property of the Owner, until such items are specifically identified by the Owner as designated for disposal or recycling. Remove equipment and items with due care for value and eventual re-use by the Owner unless the specific item has been specifically identified by the Owner as designated for recycling or disposal. Protect and store items in appropriate conditions at a designated site location, not in-situ, to ensure their security and request review by the Owner's representative. Hand over in clean condition all items identified by the Owner as salvaged items, and cooperate with the removal of such items by Owner's forces.
9. All products, and materials that are declined for salvage by the Owner become property of the Contractor. Recycle, dispose, and remove such items, at no cost to the Owner.
10. Do not encumber the site with materials. Sale of materials in situ or from site is not permitted.

3. Demolition, Salvage and Disposal

1. Remove parts of existing buildings and demolish and dispose, and to permit salvage of existing elements for re-use, and to permit new construction. Sort materials into appropriate piles for recycling and reuse.
2. Remove items to be reused, store as directed by Consultant, and reinstall under appropriate section of specification. Such removals shall be performed by the trade contractor that will refurbish and /or re-install the material or item. Disassemble items only as necessary to remove from the existing site for later examination, dismantling, and refurbishment in shop conditions.
3. Dispose of removed materials, to appropriate recycling facilities except where specified otherwise, in accordance with authority having jurisdiction. Pay all costs for removal, recycling, salvaging and /or disposal.

4. Removals, Recycling, and Disposal included in Base Bid
  1. Include all removals, recycling, and disposal work at no further cost to the Contract. This includes, but is not limited to:
    1. Roofing assemblies and curbs in areas of new roof top mechanical equipment, including:
    2. Temporary removal & reinstallation of services where necessary to facilitate roofing work;
    3. All temporary measures necessary to protect the existing building, facility, or site from damage from any cause whatsoever, between start of removals and select demolition until new construction is commissioned to perform its enclosure functions.
5. Cleaning Operations
  1. Immediately upon completion of selective demolition to building, perform cleaning operations described in this Section as necessary to clean all surfaces within and on the existing building. Perform this cleaning operation after selective demolition of floor slabs, grinding or cutting of concrete or block, and all cutting operations that may produce dust. Clean prior to removal of temporary dust-proof partitions and temporary protection at perimeter of areas under the Contractor's control.
  2. Perform cleaning operations for minimal disturbance and dust generation. Equipment shall be industrial power vacuum including wet vac type equipment for immediate drying and removal of moisture generated by cleaning operations. These methods shall be supplemented by wet methods involving environmentally-friendly degreasing and cleaning products where necessary to ensure complete removal of grease and grime. Do not use TSP.
  3. "Clean" shall mean free of dirt, grease and grime, and free of all loose scale and deposits. Where existing surfaces are to be cleaned it is not intended that they be returned to "as-new" condition. Notwithstanding, ensure removal of all grease and deposits to achieve best finish possible, using methods appropriate to the existing conditions encountered.
  4. Upon completion of cleaning operations provide protections to surfaces to ensure that upon completion of the Work and final cleaning (as performed to standards and requirements of Section 017041) the site and building are handed over to the Owner in pristine and clean condition in accordance with Division 01 requirements and the General and Supplemental Conditions of the Contract.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.
2. Trade contractors performing work to this Section's requirements shall clearly identify to bidding general contractors the inclusions and exclusions regarding concreting required for aspects of their trade work, so that bidding Contractors may co-ordinate the bidding and scope of work. All concrete required for the Work, regardless of location or section reference within the specification, is included in the Contract Price.

### 2. Related Requirements

- |  |                          |
|--|--------------------------|
| 1. Work Related to Existing Building         | Section 011030           |
| 2. Selective Demolition (of exist. Concrete) | Section 024119           |
| 3. Concrete Finishing                        | Section 033500           |
| 4. Metal Fabrications                        | Section 055000           |
| 5. Architectural Metal Fabrications          | Section 057000           |
| 6. Rough Carpentry                           | Section 061000           |
| 7. Finish Carpentry                          | Section 062000           |
| 8. Environmental Separation System           | Section 070500           |
| 9. Thermal Barrier System                    | Section 072000           |
| 10. Weather Barrier Systems                  | Section 072500           |
| 11. Fire & Smoke Protection Systems          | Section 078400           |
| 12. Joint Sealants                           | Section 079000           |
| 13. Steel Doors and Frames                   | Section 081113           |
| 14. Floor & Wall Finishes                    | Division 09              |
| 15. Mechanical Systems                       | Divisions 20, 21, 22, 23 |
| 16. Electrical Systems                       | Division 26, 27 and 28   |

### 3. Submittals

1. Submit in accordance with Division 1 requirements:
  1. Reinforcing bar shop drawings including placement. Show all laps and connections.
  2. Mix designs for all concrete and test results for all concrete.
  3. Tests of slab-on-grade moisture content prior to beginning floor coating operations and pay all costs for such testing.

### 4. Coordination

1. Contractor shall ensure that anchors, bolts, hangers, sleeves, ties, inserts, **embedded plates** and other items required to be cast into concrete as described in this and other sections of the specification, schedules and drawings are supplied for installation as described in this Section. Co-ordinate supply for timely installation.

### 5. Reference Standards and Codes

1. All Concrete Work: CAN/CSA-A23.1, A23.2 and A23.3. Where specific requirements are noted herein, they are additional to the requirements of these standards and do not supersede them unless specifically stated.
2. CSA S269.1-1975, Falsework for Construction Purposes.
3. CAN/CSA-S269.3-M92, Concrete Formwork.
4. ANSI/ACI 315-80, Details and Detailing of Concrete Reinforcement.
5. ACI 315R-80, Manual of Engineering and Placing Drawings for Reinforced Concrete Structure.
6. CAN/CSA-G30.18-M92 (R2002), Billet-Steel Bars for Concrete Reinforcement.

7. CAN/CSA-A5-93, Portland Cement.
  8. CAN3-266.1-M78, Air Entraining Admixtures.
  9. CAN3-A266.2-M78, Chemical Admixtures.
6. Quality Control
1. Source Control
    1. Upon request inform Consultant of proposed source of material to be supplied.
    2. Maintain accurate records of concreting operations to indicated date, location, shoring, re-shoring and shoring removal, quantity, air temperature, weather and test samples taken.
    3. Submit complete description of concrete mixes and performance properties from concrete ready-mix supplier, for review and acceptance of Consultant minimum 48 hours prior to confirming delivery order.
  2. Testing and Inspection
    1. Concrete testing: to CAN/CSA-A23.2 by the independent testing and inspection firm under the terms of a Cash Allowance for this purpose. See Division 1.
    2. Give Consultant and testing firm minimum 24 h notice before work that is to be tested or inspected begins.
    3. The Contractor shall supply all necessary co-operation to the Testing Firm. Supply additional labour required to assist the Firm in making tests. The cost of this material and labour shall be borne by the Contractor.
    4. The Contractor shall not rely on the Owner's program of testing, but shall perform all quality control necessary to ensure performance of cast-in-place concrete. Contractor shall arrange and pay independently for any testing or additional testing deemed necessary by the Contractor to so ensure.
7. Temporary Facilities, Temporary Controls, Temporary Utilities
1. Provide in accordance with Division 1 requirements.
8. Safety Requirements
1. Provide in accordance with Division 1 requirements.
9. Basic Product Requirements
1. Store material in accordance with CAN/CSA-A23.1.
10. Basic Execution Requirements
1. Substitutions or Alternatives
    1. Substitute different size reinforcing bars only if accepted in writing by Consultant.
  2. Cold Weather Requirements
    1. When the air temperature is at or below 5°C (40°F) or when there is a probability of it falling to that limit within 24 hours of placing, the concrete temperature shall be maintained in accordance with CAN/CSA-A23.1. Pay all costs for this work.
    2. In cold weather, concrete shall be delivered to the work having a temperature of not less than 18°C (64°F) and not more than 32°C (90°F).

3. Provide temporary heating equipment in accordance with Division 1. Protect concrete surfaces from direct exposure to the combustion gases of heaters.
  4. The housing, covering or other protection used in connection with curing shall remain in place and intact at least 24 h after the artificial heating is discontinued. No dependence shall be placed on salt or other chemicals for the prevention of freezing.
3. Hot Weather Requirements
1. When the air temperature is at or above 25°C (77°F) or when there is a probability of it rising to 25°C (77°F) during the placing period, special effort shall be made to maintain the concrete temperature in accordance with CAN/CSA-A23.1, Curing and Protection. Pay all costs for this work.
  2. In hot weather concrete shall be delivered to the work having a temperature of not less than 10°C (50°F) and not more than 27°C (81°F).
  3. Take suitable precautions to avoid drying of the concrete prior to finishing operations. Provide windbreaks, sunshades, fog sprays or other devices.
  4. Do not place concrete which has a temperature of 32°C (90°F) or above.

11. Warranties

1. Warrant all work performed as described in this Section in accordance with Division 1 requirements.

12. Identification of Building Systems

1. The work described by this Section is related to the following Building Systems as defined in Section 019010. Comply with requirements for performance, review and co-ordination of such systems:
  1. Fire Separation System
  2. Emergency Egress System
  3. Building Structural System
  4. Environmental Separation System
  5. Interior Finish System
  6. Electrical Distribution System

## 2. PRODUCTS

1. Materials

1. Portland Cement: to CAN/CSA-A5, Type GU Normal.
2. Water, fine aggregates, normal weight coarse aggregates: CAN/CSA-23.1.
3. Air entraining admixture: to CAN3-266.1.
4. Chemical admixture: to CAN3-A266.2.
5. Ready-mixed concrete: to Can/CSA-A23.1 and the requirements of these Specifications.
6. Shrinkage compensating grout: pre-mixed, non-metallic aggregate, 50 mPa compressive strength at 28 days.
7. Reinforcing bars: to CAN/CSA-G30.18, Grade 400.

8. Welded wire fabric: to CAN/CSA-G30 series, yield strength 386 mPa.
  9. Falsework materials: to CSA S269.1.
  10. Formwork materials: to CAN3 A23.1, clause 11.3. Formwork for concrete exposed to view in the finished work shall be new plywood pre-treated with non-staining agents & mineral oil only.
  11. Form Ties: removable or snap-off, to CAN3 A23.1, Clause 11.4.
  12. Granular fill under slab on grade in accordance with Section 312300, Type 2, Granular 'A'.
  13. Pre-moulded joint filler: bituminous impregnated fibreboard to ASTM D1751-83.
  14. Joint sealer/filler: for interior slabs Sika Loadflex or equivalent by WR Meadows.
  15. Sealer: proprietary poly-siloxane resin blend.
  16. All other concrete materials: to CAN/CSA-A23.1 in its latest edition.
  17. Tactile Hazard Warning Surfaces and inserts: as per Section 321600
2. Concrete Mixes
1. All concrete exposed to foot or vehicle traffic in its final condition shall have a cement content of not less than 290.7 kg/m<sup>3</sup> without water reducing admixtures or not less than 230.3 kg/m<sup>3</sup> with water reducing admixtures.
  2. Size of coarse aggregates shall be not more than 19mm (3/4") and not less than 8mm (3/8").
  3. Concrete shall meet requirement indicated in Table 8 of CAN/CSA-A23.1 for each exposure classification.
  4. Concrete shall be designed to prevent segregation and/or excessive bleeding.
  5. Determine concrete strengths from standard cylinders, sampled, cured and tested at 28 days in accordance with CAN/CSA-A23.2.
  6. Refer to Structural Drawings for strength of concrete, exposure classification and slump.
3. Mix Proportions
1. Method: Alternative (1) of CAN/CSA-A23.1.
  2. Cement type: as specified above under Materials.
  3. Minimum 28 day compressive strengths & exposure classifications as per Structural Drawings.
  4. Nominal size of coarse aggregate: Clause 14 of CAN/CSA-A23.1.
  5. Slump: to Table 6 of CAN/CSA-A23.1 and as listed above.
  6. Air content: concrete to contain purposely entrained air shall have air content in accordance with Table 10 of CAN/CSA-A23.1.
  7. Admixtures: to Clause 6 of CAN/CSA-A23.1, but allowed only as indicated in this Section.
4. Admixtures
1. Admixtures will be permitted only to correct deficiency in mixture or to make correct placement requirements as recommended by the Testing Firm and accepted by the Consultant.

2. Acceptance will be withdrawn of the use of the admixture, if, during the course of the work, concrete performance appears unsatisfactory.
  3. Accelerating admixtures may be used in cold weather subject to approval. If approved, the use of admixture will not relax the cold weather placement requirements of CAN/CSA-A23.1-M90.
  4. Set-retarding admixture may be used during hot weather subject to prior acceptance to allow for proper finishing of concrete.
  5. For all concrete exposed to weather provide 5 to 8% air entrainment. Foundation walls to below frost lines are exempted from this requirement unless otherwise noted.
5. Concrete Reinforcement Fabrication
1. Fabricate reinforcing steel in accordance with CAN/CSA-A23.1-14, ANSI/ACI 315, and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada. ACI 315R, Manual of Engineering and Placing Drawings for Reinforced Concrete Structures unless indicated otherwise.
  2. Obtain Consultant's acceptance for locations of reinforcement splices.
  3. Welding of reinforcement in accordance with CSA W186-M1990 (R2012) where splices have not been adequately maintained will only be permitted with the express written acceptance of the Consultant in each case.
  4. The fabricator and concreting trade contractor are specifically cautioned that architectural concrete requires additional clearances from finished surfaces to rebar, to account for reglets, reveals, and other detailing in the concrete.
6. Sealants
1. Provide sealant work to Section 079000 - Joint Sealers, except joints to slab-on-grade, which shall be filled as described herein.

### 3. EXECUTION

1. Formwork, Shoring and Underpinning Operations
  1. Design and undertake all formwork, shoring and underpinning operations using qualified engineering professionals and pay all costs for this design and work. Have sealed/stamped drawings on hand and provide to Consultant upon request.
2. Fabrication and Erection of Falsework and Formwork
  1. Verify lines, levels and centres before proceeding with formwork/falsework and ensure dimensions agree with drawings. Lay out work precisely, in accordance with Division requirements for field engineering and quality control. Mark on batterboards or similar construction devices that will remain undisturbed through excavation and backfill operations.
  2. Obtain Consultant's acceptance for forms framing openings not indicated on drawings.
  3. Hand trim sides and bottoms and remove loose earth from excavations before placing forms, and again before placing concrete.
  4. Design, fabricate and erect falsework in accordance with CSA S269.1.
  5. Do not place shores and mud sills on frozen ground.
  6. Provide site drainage to prevent washout of soil supporting mud sills and shores.

7. Design, fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CAN/CSA-A23.1-14 and such further tolerances as stated in Division 1 of this specification. Contractor to note formwork requirements for concrete exposed in the finished Work, and board-formed architectural concrete. Review all drawings to confirm locations and requirements for such work prior to beginning onsite operations. Do not proceed in uncertainty.
  8. Align form joints and make watertight, except board-formed, which shall have horizontal joints offset in random pattern. Keep joints between pours to a minimum.
  9. Use 25mm (1") chamfer strips on external corners and/or 25mm (1") fillets at interior corners of concrete members and joints, unless specified otherwise.
  10. Form chases, slots, openings, drips, recesses, expansion and control joints as indicated, and as necessary for the Work. Review requirements with all related trades, including masons, mechanical and electrical, before completing formwork.
  11. Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections. Assure that all anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.
  12. Clean formwork in accordance with CAN/CSA-A23.1-14, before placing concrete.
3. *Tolerances*
1. The *tolerances* for concrete work as built shall conform to the requirements of Article 10 of CAN/CSA-A23.1-14, but are further restricted by the requirements below.
  2. *Tolerances* to location relative to position of concrete surfaces shown on documents shall be as specified in Division 1 Section 014050 and the Contract definitions established therein, and further as noted in this Section. Placement and as built position of concrete surfaces shall be within *tolerance, straight, level, plumb, true*, and:
    1. *Tolerance* for slabs: Flat.
    2. *Tolerance* for equipment housekeeping slabs: Very Flat.
    3. *Tolerance* for concrete toppings to floors, as for slabs - not applicable this project.
    4. *Tolerance* for sloped toppings for roofing min 1.5% u.n.o - not applicable this project.
4. *Preparation*
1. Ensure that excavations and skim slabs are free of frost or water before placing concrete. If a sump is required for pumping water from the excavation, excavate it outside the area. Remove any wet or disturbed soil just prior to placing concrete.
  2. Before placing concrete, check that all forms are sealed tight, rigid and structurally safe.
  3. Ensure that all reinforcing steel, formwork, sleeves, anchor bolts and other items are installed in accordance with the drawings and the specifications and have been reviewed, inspected, and accepted by the Consultant and/or testing and inspection agency.
  4. Ensure that all trades have checked the security and location of all components required in the concrete by those trades, including requirements for *tolerances, clearances, and allowances* for potential movement.
5. *Co-operation with Other Sections*
1. Set sleeves, ties, anchor bolts, pipe hangers, embedded plates, and other inserts, openings and sleeves in concrete work, as supplied where described in other Sections or by other trade contractors as part of the Work

6. Field Bending
  1. Do not field bend or field weld reinforcement except where indicated or authorized by Consultant. Shop fabricate reinforcement to include hooks and bends.
  2. When field bending is authorized, bend without heat, applying a slow and steady pressure.
  3. Replace bars which develop cracks or splits.
7. Placing Reinforcement
  1. Place reinforcing steel as indicated on Contract Documents and in accordance with CAN/CSA-A23.1. Lap splices 36 bar diameters, and hook horizontal bars minimum 1'-0" (300 mm) around corners.
  2. Prior to placing concrete, obtain Consultant's review of reinforcing material and placement.
  3. Ensure and maintain the following covers to reinforcement:
    1. 75mm (3 in) from surface of concrete cast against earth;
    2. 38mm (1-1/2 in) from surface of concrete for piers and walls, except;
    3. 66mm (2 1/2") from concrete exposed to de-icing salts.
8. Construction Joints, Expansion and Contraction Joints
  1. Where construction joints are required in locations not shown on drawings, locate in consultation with Consultant.
  2. Provide shear keys in all construction joints, unless agreed otherwise for specific locations by the Consultant. Normally form keys from 50 x 100 mm (2 x 4 in) material. Depth of keys shall total approximately 1/3 of the depth of the member. In deep members, use two or more keys.
  3. Unless otherwise detailed on the structural drawings, reinforcement shall be continuous through construction joints.
  4. Cut and form control joints in slabs on grade at locations indicated, in accordance with CAN/CSA-A23.1-14, and at maximum 3000 mm on centre unless accepted by Consultant for larger spacing in limited circumstances. Fill with specified joint sealer/filler.
9. Installation of Embedded Items
  1. Set and build into work anchorage devices and other embedded items required for other work that is attached to, or support by, cast-in-place concrete. Use setting drawings, diagrams, instructions and directions provided by suppliers of items to be attached hereto.
10. Cast-in-Place Inserts
  1. Cast in sleeves, ties, slots, anchors, reinforcement, frames, conduit, bolts, water-stops, joint fillers and other inserts required to be built-in. Sleeves and openings greater than 4" x 4" (100 mm x 100 mm) not indicated, must be accepted by Consultant.
11. Slump of Concrete
  1. Slump tests shall be taken in conjunction with sampling of concrete for cylinder tests. If the inspector from the Testing Firm reports to the Contractor's representative that the slump is excessive, the Contractor shall remove the balance of that concrete from the site without demur.
  2. If the Consultant suspects that the slump of concrete is excessive and so instructs the Contractor, the latter shall carry out additional slump tests in the presence of the Consultant. No further concrete shall be placed until the test is carried out. Concrete with excessive slump shall be removed from the site. Provide slump testing equipment on site, readily available.

3. Slump tests shall be carried out following the requirements of CSA Method of Test A23.2.5C.

## 12. Depositing

1. Notify the Consultant at least 48 hours before each day's operation of placing concrete.
2. Deposit lean concrete to form engineered fill and to achieve founding soil levels and backfilling of disturbed existing soils in accordance with instructions of the geotechnical engineer appointed under the inspection and testing allowance, and to requirements of the geotechnical report reference documents.
3. Obtain Consultant's review and acceptance of forms and reinforcing before placing concrete.
4. If ready-mix concrete is used, time between adding of mixing water to the discharge of concrete into final location must not exceed 1 and 1/2 hours.
5. Deposit Concrete by pumping, chute, barrow, or other methods so that it leaves supporting delivery machinery within 1525mm (60") horizontally and 900mm (36") vertically of its final position. Methods of conveying and placing are to be such that concrete components do not segregate. For architectural concrete, provide ports to the non-exposed side of the pour for introduction of concrete and consolidate of concrete in "hard to get at" locations in the formwork. All architectural concrete pours must be pumped.
6. Concrete shall be homogenous, uniformly workable, readily placeable into corners and angles of forms and around reinforcement, without permitting materials to segregate, or excessive free water to collect on surface.
7. Unless otherwise agreed by the Consultant or noted herein, consolidate concrete in place by means of internal vibrators. Use the largest vibrator consistent with the type and location of concrete being placed. Vibrators shall be in accordance with CAN/CSA-A23.1-14, Table 13.
8. Apply vibrators systematically and at such spacing that the zones of influence overlap. Do not over-vibrate.
9. Keep one spare vibrator for every three vibrators in use in case of breakdown, and in any case a minimum of one spare.
10. Concrete when hardened shall have required strength, durability, resistance to abrasion, water tightness, appearance and other qualities specified or noted.
11. Place slabs on grade and finish slabs and toppings as set out in this Section and as additionally described in Section 033500.
12. Architectural concrete, where indicated, shall meet, in addition to the above-noted qualities, the consistency, colour, appearance and texture requirements as established by accepted mockup.

## 13. Curing

1. Cure and protect concrete in accordance with CAN/CSA-A23.1, except that curing compounds shall not be used where bond is required by subsequent topping or coating.
2. Protect concrete from drying winds, winter weather, sunshine, mechanical shock or water. Concrete shall be kept constantly damp for 72 hours by fog spraying or covering with polyethylene, or by the application of Sternson FLOR-SEAL, or approved equal curing and sealing compound.
3. Slabs and toppings shall be cured as set out in Section 033500.

## 14. Removal and Re-shoring

1. Leave formwork in place for following minimum periods of time after placing concrete.

1. 4 days for shoring and underpinning, and to recommendations of underpinning operation designer.
  2. 2 days for walls and sides of beams, and minimum of three days (72 hours) for architectural concrete.
  3. 1 day for footings, abutments, and foundation walls to be backfilled on both sides evenly.
  2. Remove formwork when concrete has reached 50% of its design strength or minimum period noted above, whichever comes later, and replace immediately with adequate reshoring. Do not remove formwork for suspended concrete until concrete has reached 75% of its minimum compressive strength.
  3. Provide all necessary reshoring of members where early removal of forms may be required or where members may be subjected to additional loads during construction as required.
  4. Space reshoring in each principal direction at not more than 3.0m (10'-0") apart.
  5. Re-use formwork and falsework subject to requirements of CAN/CSA-A23.1.
15. Treatment of Formed Surfaces Immediately Upon Stripping Forms
1. Repair honeycombed areas of "as-formed" concrete not exposed in the finished work. No additional treatment is required. Do all work in accordance with CAN/CSA-A23.1.
16. Defective Concrete
1. Excessive honeycomb or embedded debris in any concrete shall mean it is defective. Remove and replace defective concrete in its entirety, howsoever caused, at no cost to Owner and with no change to Contract Time.
17. Patching of Concrete not exposed in the Finished Work
1. Unless otherwise instructed by Consultant, patch imperfections when concrete is green as follows:
    1. Chip down edges perpendicular to the surface.
    2. Wet the area and brush on 1:1 cement-sand grout.
    3. Patch with 1:2 cement-sand mortar, with 10% hydrated lime.
18. Cast-in-Place Finishes Exposed to View Other than Architectural Poured Concrete
1. Finishing of floor slabs and toppings is described in Section 033500.
  2. Equipment pads: smooth trowel surface to flatness specified.
19. Cast-in-Place Grout
1. Grout voids under any base plates or lintels, in co-ordination with work described in Division 5.
  2. Grout into place, bolts and other items of concrete hardware, that are not placed prior to pouring concrete.
  3. Mix and place grout in one continuous operation to fill voids completely. Conform with supplier's written specifications.
20. Further Concrete Work
1. Provide housekeeping pads, curbs, and other concrete in co-ordination with the Mechanical and Electrical Trade Contractors. Equipment pads: smooth trowelled surface to flatness specified.
  2. Provide all concrete work shown on drawings and as reasonably required to complete Work.

21. Protection

1. Protect all exposed concrete work from staining and/or physical damage to integrity or finish.
2. Replace damaged work that cannot be repaired or restored to the Owner's acceptance. Pay all costs for this remedial work.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.

### 2. Related Requirements

- |  |                          |
|--|--------------------------|
| 1. Cast-In-Place Concrete                    | Section 033000           |
| 2. Environmental Separation Systems          | Section 070500           |
| 3. Floor Finishes including Concrete Sealing | Division 09              |
| 4. Floor Drains and Mechanical               | Divisions 20, 22, and 23 |
| 5. Electrical Devices and Electrical         | Division 26, 27, and 28  |

### 3. Submittals

1. Submit in accordance with Division 1 requirements:
  1. Mix designs for slabs, for acceptance of Consultant.
  2. Marked slab drawings showing the locations of all saw-cuts to slabs-on-grade, for acceptance of Consultant prior to beginning slab pour operations.

### 4. Reference Standards & Codes

1. ASTM C1315-03: Standard Specification for Liquid Membrane-Forming Compounds for Curing and Sealing Concrete.
2. Concrete materials and methods of construction: to CAN/CSA-A23.1-04, CAN/CSA-A23.2-04, and CAN/CSA-A23.3-04 unless otherwise specified. Where specific requirements are noted in this Section, they are additional to the requirements of these standards and do not replace them unless specifically stated or more stringent.
3. CSA A23.2-04: Methods of Test for Concrete.
4. All concrete materials, reinforcing, and accessories shall conform to the requirements of Section 033000 as if repeated herein.

### 5. Quality Control

1. Execute the Work of this Section only by a subcontractor who has adequate equipment and skilled tradesmen to perform it expeditiously, and is known to have been responsible for satisfactory installations similar to the specified, during a period of at least the immediate past three (3) years.
2. Ensure that concrete supplied for slabs contains no admixtures which would be incompatible with floor hardener materials or other applied finishes.
3. Upon request inform Consultant of proposed source of material to be supplied.

### 6. Basic Execution Requirements

1. Perform Work only when environmental conditions are as specified in Section 033000.
2. Ensure that adequate temporary heating is provided as required for cold weather work.
3. Ensure that all floor drains are onsite and set for proper heights or are ready for install as part of floor pours.

4. Ensure that all flooring installations for ceramic tile, resilient goods, carpet, and other flooring have been reviewed and co-ordinated with top of slab elevations.
7. Warranties
  1. In accordance with Division 1 requirements, warrant concrete finishing work for 1 year in accordance with GC12.3 against cracking and spalling in conditions of service, other than hairline cracking.
8. Building Systems Requirements
  1. The work described by this Section is a component of the following Building Systems as defined in Section 019010. Comply with requirements for the integration of the work described in this Section into its roles in the various systems. Provide the work so that the performance requirements of the overall system of which it forms part is achieved.
    1. Emergency Egress & Exiting System
    2. Building Structural System
    3. Interior Finish System

## 2. PRODUCTS

1. Materials
  1. Unless specified otherwise, materials shall meet the specified requirements of Sections 033000 & 321600, with strength requirements to meet specifications for structural concrete in the Work.
  2. Curing protection: burlap sacking, wetted, with 6 mil poly upper layer, with lumber to provide continuous weighting to all lapped joints and as required to keep protection in place.
  3. Sealer: 100% water-based acrylic copolymer, ASTM C309, Type 1, Class B, such as Vocomp 20 .
  4. Hardener for Interior Slabs: Sealtight Type R by WR Meadows or Diamag 7 by Sika.
  5. Water: potable.
  6. Patching Compounds:
    1. For local repairs under subsequent floor finishes except areas to receive resinous floor coatings use Mapei Plani-Patch or equivalent cementitious floor levelling compound, for patches of less than 13mm (1/2") depth.
    2. For larger repairs, select cementitious product to acceptance of Consultant that is specifically designed for applications exceeding 13mm (1/2") depth.
    3. Use primers wherever recommended by manufacturers of such products for the specific application, and ensure substate preparation by removal of all finishes and acid etching of the substrate.

## 3. EXECUTION

1. Examination
  1. Verify existing conditions are ready to receive work. Ensure that surface areas are acceptable to receive and maintain concrete finishing and that specified installation will be achieved.
  2. Verify concrete slabs contain no admixtures that would be incompatible with floor hardener materials or other applied finishes.

3. Examine existing slabs after removal of surface finishes by select demolition, and in preparation for grinding. Report any deficiencies in removals of ceramic tile, adhesive, or other surface finishes that may impede production of a smooth ground floor ready for finish sealer.
  4. Beginning of application implies acceptance of existing site conditions.
  5. Do not begin operations for toppings to precast concrete structural floor installations until installation has been completely accepted by Consultant and inspected by Owner's Testing and Inspection agency, and all deficiencies remedied and witnessed.
2. Installation
1. Place concrete for slabs in accordance with Section 033000 and to ensure uniformity of concrete without segregation. Ensure under-slab insulation and vapour retarder is in place, lapped, sealed, and accepted by Consultant. Edges of slabs-on-grade to foundation walls shall receive poly bond breaker to face of walls where so detailed. Do not use asphalt impregnated fibreboard in these locations.
  2. Install reinforcing to appropriate depth in slabs, wherever detailed or scheduled. At all corners of slab pours where slab extends around jambs to form finished top of foundation walls at doors or openings, install three 900 mm long 15 m bars spaced 100 mm apart on the diagonal, to control shrinkage and cracking at such areas.
  3. Form and pour trench drains, pits, and similar items with initial construction pours and obtain acceptance of Consultant for such items prior to scheduling slab pouring operations. Ensure reinforcing is bent and set suitably for integration with slab pour.
  4. Ensure that all inserts to slabs for recessed grates and floor grilles are onsite and properly located and set prior to beginning pour. Ensure all plumbing elements such as floor drains, fixtures, oil/grit separators poured catch basins, and similar are properly installed and located for relation to slab and subsequent floor finishes prior to beginning slab pour operations.
  5. For slabs poured for cutting and patching in existing concrete slabs, ensure all reinforcing and edge preparation is complete prior to beginning work. Ensure underslab elements such as mechanical or electrical, and compacted bases, are inspected and accepted by Consultant and authorities having jurisdiction, as applicable.
  6. The top of final surface of all horizontal concrete shall be finished by one, or more, of the following operations of screeding or floating.
    1. Screeding consists of moving a straight edge or template with a sawing motion along approximately 1"  $\varnothing$  pipe screeds. The screeds shall be accurately established on rigid supports at the specified elevation. Screeding shall be done immediately after consolidation of the concrete to give the surface its approximate shape and elevation.
    2. Floating consists of accurately finishing the concrete surface with a wood float to the elevation or profile shown. Floating shall follow screeding but shall not be started until some stiffening has taken place in the concrete surface. Power float all slabs-on-grade to develop smooth and hardened finish. For slabs that receive tile or resilient flooring or epoxy coating finishes, provide finished surfaces to each area to suit subsequent bonding and performance of the floor finish.
  7. Form gradual falls and recesses to floor drains throughout room floors that shall drain in the finished work. Do not form local falls in areas of drain only. To all areas of floors that are to receive recesses and slopes, this contract requires installation of slopes at time of floor pour, or installation of recesses and subsequent topping mix installation to requirements of Section 033000 to achieve recesses and falls. For areas of topping 1/2" or less use Mapei Plani-Patch. Install in accordance with manufacturer's instructions for best adherence to substrate. Prepare substrates to receive toppings and patching by acid etching the underlying slab.

8. Grind the existing slab after completion of all cutting and patching, to produce an even floor slab finish and non-slip texture ready for application of clear sealer and floor finish.
3. Hardener, Curing, Sealing
  1. All interior concrete slabs with floor finishes identified for hardeners and sealers, and to all slabs not specifically noted for installation of floor finishes or concrete staining, apply hardeners and sealers at rate and at stage of finishing as recommended by manufacturer for industrial wheeled traffic in loading dock or similar environments of use.
4. Floor Surface Curing
  1. Water cure floor slabs using wetted burlap for a minimum of 2 (two) days and further as required for curing conditions. No exceptions. Further cure and protect concrete in accordance with CSA A23.1 Section 7.4
5. Sawcutting
  1. Do not sawcut suspended slabs or toppings, even when poured against grade.
  2. Sawcut interior slabs-on-grade at maximum 10'-0" centres, and as indicated on drawings. Sawcut to 1/4 depth of slab-on-grade, thoroughly clean, fill with Loadflex, for full joint depth.
  3. Perform sawcutting as soon as practically possible for minimum raveling of slab; and within 24 hours of placement of concrete.
6. Tolerances and Quality of Flatness and finishes Required by this Contract
  1. Maximum Variation of Surface: 3mm (1/8") in 3.0m (10'-0").
  2. All floors and toppings shall achieve level "Flat" in referenced standards, except for fall lines of sloped areas to drain in rooms and areas with floor drains.
  3. All floors receiving recesses and slopes shall have these slopes formed at initial pour, with wood form edges inserted to ensure support for surrounding concrete during finishing operations. Alternatively, pour slabs and recessed areas in separate pours with reinforced joints.
  4. Finish slabs in strict conformance with a pre-pour consultation and to recommendations of trade contractors providing subsequent floor finishes. Different areas of the slabs may be finished differently.
7. Patching and Refinishing
  1. Before installation of subsequent work, patch and refinish defective and existing surfaces with floor patch compounds, Mapei Plani-patch, to maximum thickness of 13mm (1/2"), to local patch areas only where vinyl, linoleum, carpet or similar finishes are to be installed.
8. Protection
  1. Ensure that finished concrete floor areas are protected from abrasion from foot or wheeled traffic, and from damage caused by spillage of oil or other harmful materials.

**END OF SECTION**

1. GENERAL

1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.

2. Related Requirements

- |  |                |
|--|----------------|
| 1. Work Related to Existing Building               | Section 011030 |
| 2. Removals  | Section 024119 |
| 3. Historic Mortar and Grout                       | Section 040310 |
| 4. Historic Masonry Cleaning and Coatings Removals | Section 040306 |
| 5. Historic Masonry Procedures                     | Section 040511 |
| 6. Environmental Separation System                 | Division 07    |

3. Work related to Existing

1. Provide masonry restoration removal, salvage, cleaning, and reinstallation work as shown on the Drawings and specified herein. This includes but is not limited to cutting and patching of masonry to accommodate portions of the Work.

4. Definitions

1. Defective mortar joints: Mortar joints are deemed defective:
  1. Where cracks have developed at the masonry unit/ mortar interface;
  2. Where cross cracks, due to shrinkage are apparent;
  3. Where mortar is spalled, chalked, dusted or otherwise crumbling and excessively weathered back.

5. Submittals

1. Submit in accordance with Division 1 requirements:
  1. Survey of Existing Masonry: Undertake pre-construction masonry survey to identify all areas of masonry requiring replacement, repair, repointing, and deep pointing. Obtain acceptance of survey from Consultant and Owner. Submit proposed method for curing and environmental protections.
  2. Mockup: All work to Historic Brick Masonry is subject to pre-construction conference and trial mockup of a selected portion of the brickwork, to confirm methods and materials for restoration and cleaning operations.
  3. Samples: of all Brick and Mortar Materials.
  4. Shop Drawings: Describing method of brick replacement and temporary shoring/bracings required at openings. All shops drawings and descriptions shall be stamped by P.Eng licensed to practice in the Province of Ontario.
  5. Written description of curing and environmental protection methods.

6. Reference Standards

1. Do masonry work in accordance with specified standards in this and related specification sections. Work requires historic authenticity and accuracy.
2. Comply with A Guideline-for Silica on Construction Projects - Revised April 2011@ requirements as issued by Occupational Health and Safety Branch of the Ministry of Labour.
3. Canadian Standards Association (CSA):

1. CSA A82 Fired Masonry Brick Made from Clay or Shale
  2. CSA A179 Mortar and Grout for Unit Masonry
  3. CSA S304 Design of Masonry Structures
  4. CSA A370 Connectors for Masonry
  5. CSA A371 Masonry Construction for Buildings
4. Parks Canada Standards and Guidelines for the Conservation of Historic Places in Canada (2010).
7. **Qualifications**
    1. Work to masonry and masonry restoration shall be performed by experienced restoration masons and masonry cleaners, with minimum 10 (ten) years experience, and as acceptable to the Consultant.
    2. Evidence of experience and qualifications for each mason so employed in the Work must be submitted and accepted by the Consultant and Owner prior to performing work to masonry in this Contract.
8. **Building Systems Requirements**
    1. The work described by this Section is related to the following Building Systems as defined in Section 019010. Comply with requirements for performance, review and co-ordination of such systems:
      1. Building Structural System.
      2. Environmental Separation System.
      3. Exterior Finishes Systems

## **2. PRODUCTS**

1. **Materials**
  1. Masonry mortar: Refer to Section 040310.
  2. Brick Units: Refer to elsewhere in Division 04.
  3. Sealant: Refer to Section 079000.

## **3. EXECUTION**

1. **Masonry Survey**
  1. Undertake a pre-construction masonry survey of all areas of the building to identify areas of masonry requiring repair, for verification with Consultant:
    1. Report in writing to consultant areas of deteriorated mortar and brick revealed during work. Obtain Consultants acceptance and instructions for mortar mix required for deteriorated mortar areas revealed during the work, prior to proceeding with the Work.
    2. Investigate possible structural issues and report to Consultant prior to proceeding with Work.
    3. Study original building pointing styles and methods of reproducing them, and submit samples for acceptance prior to commencement of Work.
    4. Immediately notify Consultant of any evidence of hidden moisture damage or structural distress and stop work in that area.

2. Masonry Work
  1. To exterior masonry, provide removals of loose and partially adhered coatings only. The intent of this Contract is not to effect complete removal of coatings from brickwork, but removal of loose and loosely adhered portions of paints and coatings. See Section 040306.
  2. Comply with sequence of work as specified in Section 040511.
2. Cutting and Patching
  1. Remove and relay complete existing brick units as required to perform cutting and patching for other portions of the Work. Do not cut units in situ.
  2. Set units in full bedding of historically accurate mortar. Allow to fully set before allowing loading, such as for bearing plates or pockets.
  3. Remove mortar dropping from face of masonry before mortar is set. Sponge stone free of mortar along joints as work progresses.
  4. Repoint all joints with mortar to Historic Accuracy and as directed by Consultant based upon accepted sample of historically authentic masonry.
3. Repointing of Joints Where Required or Indicated on Drawings
  1. Provide prototype sample wall area of repointing for review by Consultant, prior to performance of any repointing work. Reviewed and accepted area will be basis for remainder of Work.
  2. Cut out and repoint mortar joints in work areas as shown. Hand chisel joints to full width of joint and to a uniform depth of 2 to 22 times the width of the joint, and minimum depth of 25mm (1"). If mortar is hard and portions of masonry are breaking free, hand tools or reciprocating plunge-blade mortar saw may be used to score not more than a of the middle of each joint. Hand cut remaining mortar out of horizontal joints and vertical joints. Grinder to be hand size and electrically powered if used. The mortar remaining in the joint should be left square cut and flat before final removal of dust and debris. Do not widen joints with power tools. Clean dust and debris by gentle flushing with clean water just prior to filling joints. Allow water to soak into masonry and mortar, leaving no standing water, but remaining wet.
  3. Dampen joints prior to repointing. Avoid over-wetting causing mortar bleeding onto brick.
  4. Fill-pack cracks beyond 2 times the joint width or a minimum 1" (25mm) depth with stiff consistency mortar. Build up pointing in successive layers, of 3/8" (9mm) thickness, allowing each layer to harden before application of the next. It should not be possible to leave a thumb print impression.
  5. Do not contaminate faces of units with mortar. Do not over cover shoulder edge of units with fillet of mortar. Fill joints with a slicker, pulling it over the mortar surface to compress the filled joint. Tool with jointer to match existing original lime mortar joints at adjacent areas and provide textured finish and expose the aggregate to match existing. Remove binder with soft-bristled brush. Remove mortar with tool burns or that which displays hairline cracking due to excess water in the mortar.
  6. Days work should end at an appropriate location that will avoid colour differences from being too noticeable when repointing continues.
  7. Provide adequate protection during hot days. Avoid building out mortar to a protruding unit; keep joint plumb.

4. Curing of Mortars Where Pointing or Filling of Joints has been performed.
  1. Protect pointing work from direct exposure to wind and sun which can cure mortar too quickly and unevenly.
  2. Work in Cold Ambient Conditions
    1. Comply with requirements of CSA A371.
    2. Comply with requirements of pre-mixed mortar manufacturer.
    3. Protect freshly laid masonry from drying too rapidly by means of waterproof, non-staining coverings.
    4. Maintain dry beds for masonry and use dry masonry units only. Do not wet masonry units in winter.
    5. For masonry work which will be done below 5°C:
      1. Measure temperatures of masonry material prior to use.
      2. Maintain temperatures as close as possible for mortar batches.
      3. Ensure mortar temperature on mortar boards does not exceed 50°C.
      4. Use dry masonry units.
      5. Lay masonry on unfrozen surfaces free from snow and ice.
      6. Use windbreaks when laying masonry not protected by enclosures.
      7. Provide a high low registering thermometer where directed on site.
    6. When mean air temperature will, over a 24 hour period, go below 5°C but not below 0°C, conduct masonry work as for normal temperatures except heat water or sand to produce mortar temperatures between 5°C and 50°C. Protect entire constructed masonry by enclosing within weatherproof membrane for 72 hours.
    7. When mean air temperature will, over a 24 hour period, go below 0°C, conduct masonry work as for normal temperatures except heat water and sand to produce mortar temperatures between 5°C and 50°C and maintain temperature of mortar boards above 0°C. Protect entire constructed masonry by enclosing within weatherproof membrane for 7 (seven) days and maintain air temperature within enclosure at minimum 4°C.
  5. Review
    1. Review of prepared cut out joint and backup mortar by Consultant is required prior to repointing. Areas requiring deep pointing beyond 2 to 22 times the width of joint because of no backing, or inadequate backing, must be reviewed by Consultant prior to cutting out and deep pointing.
  6. Cleaning Masonry
    1. Clean existing masonry to interior of Main Level in accordance with Section 040306.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division One, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.
2. Work to masonry and masonry restoration shall be performed by masons experienced in restoration work and use of the specified equipment, and prior to any re-installation of stone or brickwork in the Work. Sequence cleaning and removal to follow selective demolition operations. This shall require multiple mobilizations at no cost to Owner.
3. See also Section 024119 Selective Demolition and Cleaning.
4. This Section shall be read in conjunction with all sections of Division 4, and Reference Documents regarding Historic Preservation.

### 2. Related Requirements

- |  |                |
|--|----------------|
| 1. Work Related to Existing Building               | Section 011030 |
| 2. Removals  | Section 024119 |
| 3. Historic Mortars and Grouts                     | Section 040310 |
| 4. Historic Masonry Cleaning and Coatings Removals | Section 040306 |
| 5. Historic Masonry Procedures                     | Section 040511 |
| 6. Environmental Separation System                 | Section 070500 |
| 7. Roofing Work                                    | Section 075200 |
| 8. Fire & Smoke Protection Systems                 | Section 078400 |
| 9. Joint Protection                                | Section 079000 |

### 3. Submittals

1. Submit in accordance with Division 1 requirements:
  1. Cleaning Methodology
    1. Submit description of cleaning method used for cleaning of mock-up areas. Description shall include but shall not necessarily be limited to, temporary measures, all equipment proposed, water pressure and temperature at the compressor, tools, nozzle size and distance from masonry surface, abatement and disposal procedures, and environmental protections.
  2. On Site Mock up
    1. Conduct tests on areas of exterior masonry to location accepted by Owner & Consultant.
    2. Notify Consultant 24 hours before commencing cleaning of test patch areas for their attendance.
    3. Conduct multiple tests on building to determine effectiveness of (low pressure, moderate pressure, high pressure, heated pressure) wash cleaning methods.
    4. Conduct test to determine effectiveness of water pressures, time periods, flow rates, water temperatures, size of nozzles, and spraying distances from wall surfaces.
    5. Test pressure at each storey to determine effect of "line drop" of water pressure.
    6. Test brushing and spraying as alternative to pressure washing.
    7. Add increasing amount of surfactant until cleaning can be done efficiently.
    8. Allow for 3 (three) alternate test cleaning tests per patch area.
    9. Allot test panels to sry fro three to seven days prior to Consultant's review.

3. Test Report

1. Submit one copy of test results describing cleaning method, tools, successive steps, and techniques used for cleaning of each test patch.
2. Proceed with cleaning upon written acceptance by Consultant concerning tested cleaning methods.

4. Demonstrate methods for acceptance of Consultant during performance of test mockup patches.

3. Safety Requirements

1. Protection

1. Mask or seal vents, windows, and other openings, to prevent water damage.
2. Mask wood, glass, and metal adjacent to masonry.
3. Protect all areas from wetting during performance of damp cleaning.
4. Hang sheeting material to protect adjacent areas from dust.
5. Workers to wear protective gloves, coveralls, boots, eye, head and face protection, and filter masks as appropriate for materials used and dust or debris generated.

4. Basic Product Requirements

1. Alternatives methods: Changes of cleaning method, cleaning medium, tools, or techniques from those agreed to at mockup and testing, must be authorized in writing by Consultant.

5. Warranties

1. Warrant in accordance with Division 1 requirements.

6. Building Systems Requirements

1. The work described by this Section is related to the following Building Systems as defined in Section 019010. Comply with requirements for performance, review and co-ordination of such systems:
  1. Building Structural System
  2. Environmental Separations Systems
  3. Exterior Finishes System.

## 2. PRODUCTS

1. Materials

1. Use clean potable water free from harmful materials.
2. Detergents shall be household level, free of dissolved salts/chlorides. Do not use industrial chemical detergents.
3. Grease removers and neutralizing agents for efflorescence shall be proposed by trade contractor for acceptance of the Consultant.
4. Phosphate-based cleaners or neutralizers are not acceptable. All materials must be approved for use in functioning commercial kitchen environments, and further to this specification.

3. Tools and Equipment

1. All work shall be hand tool performed. Do not use electrically operated equipment without acceptance of Consultant.

2. Tools and Equipment shall be for dry removal, followed by damp cleaning, as set out herein.

### 3. EXECUTION

#### 1. Preparation

1. Place safety devices and signs near work areas as indicated and directed.
2. Seal or repair openings and joints, and cover surfaces not to be cleaned in work area.
3. Remove existing signage and electrical and mechanical prior to performing removals and cleaning. Perform cleaning prior to installation of new electrical, mechanical, equipment, or other new portions of the finished Work.
4. All work shall be carefully performed in accordance with accepted mock-up.

#### 2. Execution of Cleaning

##### 1. Removal of Loose Material

1. Remove loose coatings and paints to existing brick masonry by first stress rolling with heavy duty studded rubber roller to loosen and crack coatings and break loose bonds with the masonry. Brush clean with fibre non-ferrous bristle brush. After manual descaling and hand brushing of brick facings and existing coatings, and prior to repointing masonry mortar joints that have existing holing or loose mortar, provide damp cleaning as set out below.
2. Use only pressure wash and/or spray techniques acceptable to Owner and Consultant based on mock-up and cleaning procedures. Misting, brushing and sponging, are further acceptable methods of cleaning existing brickwork. Begin any wet work from the bottom of the masonry and work upward. Ensure completed portions are kept moist so that streaks and dirt can be sponged off as work progresses above.
3. Under no circumstances shall mechanical abrasion, metal or carborundum rollers or pads, disc or belt sanders be utilized.

##### 2. Brushing and Scraping

1. Use brushing and scraping only to supplement dry stress rolling, prior to damp washing.
2. Soften and loosen deposits with wood and fibre bristle brush. Do not use metal tools.
3. Provide consistent cleaning across areas when brick is dry, followed by damp.

##### 3. Damp Cleaning

1. Provide brush and sponge application of supplemented water method for cleaning for brick masonry areas that will form finished surfaces in the Work, and elsewhere as noted on Drawings. Do not use pressure-wash or hose wetting.
2. Remove material through successive misting and sponging, performed in successive passes in accordance with accepted mockup methods.
3. To masonry for cleaning after removal of loose coatings, provide protection to trim, windows, and flooring using plastic sheeting. Clean brick masonry as follows:
  1. Remove large particles with wood paddles without damaging surface. Saturate masonry with clean water and flush off loose mortar and dirt by misting and sponging only. Do not hose down interior masonry.

2. Brush scrub with solution of 35ml household detergent dissolved in 1lt of clean water using stiff fibre brushes, then clean off immediately with clean water by sponging.
  3. Repeat cleaning process as often as necessary to remove loose material and efflorescence, and in accordance with accepted mockup sample and procedures.
3. Required Performance
    1. Remove all loose coatings and surface scale to all areas where mechanical stress rolling has cracked coatings or created loose coatings. Remove all dust and surface efflorescence and similar, with first dry and then damp methods.
    2. The Contract requires complete removal of existing coatings and graffiti.
  4. Low to Medium Pressure Water Cleaning Methods
    1. Where low to medium pressure water cleaning methods are used:
      1. Perform cleaning with process established through test cleaning process.
      2. Carefully remove exfoliating material, and loose and peeling paint by scraping & brushing.
      3. Soften and loosen heavy deposits with prolonged water spray, then brush. Remove thick incrustations with wooden or plastic scrapers.
      4. Start with low-pressure water and progress to medium-pressure in areas, as agreed during test cleaning stage.
      5. Scrub area using natural bristle or synthetic bristle brushes.
      6. Work from bottom up.
      7. Hold nozzle perpendicular to surface, work at uniform rate and uniform distance from surface.
      8. Do not exceed maximum pressure at nozzle or have nozzle closer to masonry than established during the test cleaning.
      9. Repeat process as required, until masonry is clean.
      10. Carry out a final thorough water rinse with clean water.
  5. Water Washing with Non-Ionic Detergent Methods
    1. Where water washing with non-ionic detergent methods are used:
      1. Perform cleaning with process established through test cleaning process.
      2. Carefully remove exfoliating material, and loose and peeling paint by scraping & brushing.
      3. Soften and loosen heavy deposits with prolonged water spray, then brush. Remove thick incrustations with wooden or plastic scrapers.
      4. Commences using a detergent only once agreed with Consultant.
      5. Add non-ionic detergent diluted to manufacturer's recommendation in water.
      6. Start with a low-pressure water and progress to higher pressure areas, as agreed with Consultant during test cleaning
      7. Scrub areas using natural bristle or synthetic bristle brushes.
      8. Work from bottom of wall up.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.

### 2. Related Requirements

- |   |                |
|---|----------------|
| 1. Historic Masonry Restoration                   | Section 040300 |
| 2. Historic Masonry Cleaning and Coatings Removal | Section 040306 |
| 3. Historic Masonry Procedures                    | Section 040511 |
| 4. Historic Brick Replacement                     | Division 04    |

### 3. Reference Standard

1. Do masonry mortar work in accordance with CAN/CSA A179 04 except where specified otherwise herein. Ready mixed mortar for stone masonry, where acceptable, shall conform to ASTM C1142.

### 4. Submittals

1. Submit in accordance with Division 1 requirements:
  1. Submit duplicate samples of cured mortar for each mortar mix to match existing mortar colours for review by Consultant. Provide identification of components and proportions with each set of samples. Submit manufacturer's product data for each component.
  2. Survey of Existing Masonry: Undertake pre-construction masonry survey to identify all areas of masonry requiring replacement, repair, repointing, and deep pointing. Obtain acceptance of survey from Consultant and Owner. Submit proposed method for curing and environmental protections.
  3. Mock-ups: Construct a mock-up to show the following:
    1. Cut and cleaned mortar joint to required depth;
    2. Filled and tooled joint;
    3. Up to 4 (four) selected mortar colour samples;
    4. Mock-up to be minimum 3'-6" x 3'6" (1.0m x 1.0m) area, for each masonry material, where directed by the Consultant, and to demonstrate a complete understanding of specified procedures, techniques, and formulations, prior to commencement of work.
    5. Contact consultant to review mock-up, minimum 48 hours, prior to proceeding with repointing work.
    6. Accepted mock-up shall establish the minimum standard of acceptance for the work of this Section.

### 5. Warranties

1. Warrant in accordance with Division 1 requirements.

### 6. Building Systems Requirements

1. The work described by this Section is related to the following Building Systems as defined in Section 019010. Comply with requirements for performance, review and co-ordination of such systems:
  1. Building Structural System.
  2. Environmental Separation System.

## 2. PRODUCTS

### 1. Materials

1. Water: Incorporate potable water free of contaminants.
2. Cement: White portland cement as manufactured by Federal Cement Ltd., Ingersoll, Ontario (grey cement has too many impurities).
3. Lime: Hydrated lime Type S, to ASTM C207.
4. Mortars:
  1. Mortars are based on the proportion specifications of CSA A179M.
  2. Type N mortar for back-pointing and bedding mortar, bag-mix King 1-1-6 by Sika, Dubois Betomix plus Type N, or equivalent.
  3. Tint pointing mortars to match existing, as specified herein.
5. Aggregate: Graded and washed sand matching existing range of sizes and colour of aggregate in existing mortar, and in accordance with accepted mock-up.
6. Do not use a bonding agent or admixtures unless accepted in writing by Consultant.
7. Use same brands of materials and source of aggregate for entire project.
8. Admixture for Colours: Inorganic pigment, dry powder, mineral oxide type, not to exceed 10% of portland cement by weight. AColourTech®, as manufactured by QC Construction Products Canada

## 3. EXECUTION

### 1. Measurement and Mixing

1. Slake lime in barrel off site using adequate precautions against splashing. Screen liquid through a 3mm mesh screen then store mix under 100mm (4") of water for two weeks or until standing water has cleared. Alternatively, prepare lime putty from hydrated mason's lime at least 24 hours before use. Incorporate colourant admixture into mortar mixes in accordance with manufacturers instructions.
2. Mix aggregate, cement and lime putty according to the proportion specification as per above.

### 2. Pointing Mortar and Filling Holing and Imperfections in Masonry after Removals

1. One-consistent mason to be dedicated to mixing, to ensure consistency in mix and colour.
2. Pre-hydrate pointing mortar by mixing ingredients dry, then mix again adding just enough water to produce damp workable mix that will retain its form when pressed into ball. Allow to stand for not less than 1 hour nor more than 2 hour then remix with sufficient water to produce mortar of proper consistency for pointing.
3. Furnish white mortar base throughout for tinting mortar to match colours of approved samples. Ensure consistent mortar properties, sand type, quantity of pigment and water-cement ratios for colour consistency.
4. Measure and batch mortar materials either by volume or weight, such that the required proportions can be accurately controlled and maintained. Measurement of sand or other materials exclusively by shovel will not be permitted.

5. Mix mortar with the maximum amount of water consistent with workability to provide maximum tensile bond strength within the capacity of the mortar.
  5. Mortar should be used within 2 hours following mixing.
  6. Refer also to curing and environmental requirements as set out in Historic Masonry restoration.
3. Protection
1. Protect adjacent finished work against damage that may be caused by the work of this Section.
  2. At end of each working day, cover unprotected work with waterproof (or insulated tarps, or heated enclosure). Extend tarps to 0.5m over surface area of work and install tightly to prevent finished work from drying out too rapidly and to prevent weather from eroding recently repointed material.
  3. Maintain tarps in place for a minimum of one to two weeks after repointing.
  4. Ensure that bottoms of tarps permit airflow to each mortar in joints.
  5. Anchor coverings securely in place.
  6. Install and maintain moist burlap protection during the curing process:
    1. Minimum 7 (seven) days during summer months or hot weather;
    2. Minimum 21 (twenty-one) days in cold weather conditions, using dry heated enclosures.
  7. Wet mist burlap only. Ensure no direct spray reached surface of curing mortar.
  8. Shade areas of work from direct sunlight during periods over 25°C and maintain constant dampness of the burlap.
  9. Maintain ambient temperature of 10°C for a minimum of 15 (fifteen) days after repointing masonry.
  10. No exhaust products shall enter curing area.
  11. Temporarily re-route building exhaust outlets away from curing area(s).

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated herein.
2. This Section describes the general standards and requirements applicable to all other related masonry Sections of the Specifications.
3. The work involves the conservation, restoration and repair of existing historic masonry.
4. Work to masonry and masonry restoration shall be performed by experienced restoration masons acceptable to the Consultant. Submit evidence of experience and qualifications for each mason so employed in the Work.
5. Provide masonry restoration removal, salvage, cleaning, and reinstallation work as shown on the Drawings and specified herein.
6. The intent is to carry out the work described herein in accordance with established procedures for historic masonry conservation where the intent of conservation is to preserve wherever possible the character and materials of the original building fabric and not necessarily to restore building facades to their original pristine as-built condition.
7. Provide all labour, material and equipment, and perform all operations required to carry out all masonry work as described herein, as described on the Drawings and as required for the proper completion of the Work.

### 2. Related Requirements

- |  |                |
|--|----------------|
| 1. Historic Masonry Restoration                  | Section 040300 |
| 2. Historic Mortar and Grout                     | Section 040310 |
| 3. Historic Masonry Cleaning & Coatings Removals | Section 040306 |

### 3. Special Project Requirements

1. Should disassembly of existing masonry be required, carry out the work in the following sequence:
  1. Masonry cleaning as applicable and accepted by Consultant.
  2. Cutting out and re-pointing masonry shall be to accepted review of mason's proposed procedures only.

### 4. Submittals

1. Submit in accordance with Division 1 requirements:
  1. Submit shop drawings, product data, samples, etc. as required for work of this Section and by related Sections.

### 5. Reference Standards

1. Do masonry work in accordance with CAN3 S304 except where specified otherwise.

### 6. Quality Control

1. Provide competent trade foreman, well skilled and experienced in the specialized type of work required, for continuous supervision.

2. Provide specialized skilled and competent tradesmen who shall have had considerable experience in this type of work.
  3. Submit, if requested, a detailed list of projects and experience relating to any of the above workers.
7. Basic Product Requirements
1. Designated Substances
    1. Silica is present in mortar and masonry units. Disturbance of materials containing silica will occur during cutting or grinding of mortar joints and stone masonry units. The Contractor undertaking this work is responsible for ensuring that workers performing the work and the public are not exposed to airborne silica levels in excess of 0.20 mg/m<sup>3</sup>. This can be accomplished by:
      1. Providing workers with suitable respiratory protection and disposable coveralls if airborne levels are in excess of regulated limits;
      2. Misting work area with water to suppress dust levels and avoiding dry sweeping of dust and debris during cleanup (i.e., use damp mopping or HEPA vacuums);
      3. Ensuring that adequate temporary ventilation is available inside the work area.
    2. It should be noted that the use of mechanically powered tools for the work increases the concentration of airborne silica and therefore requires more stringent respiratory protection and controlled work procedures.
    3. Precautions must be taken, during construction disturbance of silica, to ensure that persons exposed are protected. Constructing physical barriers and using polyethylene drop sheets or enclosures to isolate the work area will control silica levels.
    4. Comply with A Guideline - Silica on Construction Projects - Revised April 2011", as issued by Occupational Health and Safety Branch Ministry of Labour.
  2. Delivery, Storage and Handling
    1. Deliver materials to job site in dry condition.
    2. Keep materials dry until use.
    3. Store materials under waterproof cover on pallets or plank platforms held off ground by means of plank or timber skids.
8. Basic Execution Requirements
1. Cold Weather Requirements
    1. No masonry work shall be carried out when air temperatures fall below 5°C unless the following provisions are made:
      1. When air temperatures fall below 5°C, provide a weather-tight, heated enclosure in which to carry out work, store all materials and mix mortars, and in which the air temperature is maintained above 5°C at all times.
      2. Maintain these conditions for a minimum of 72 hours following completion of any masonry work.

2. Hot Weather Requirements

1. When wall surfaces or ambient temperature reach 25°C, protect new work from rapid drying by providing burlap protection kept misted as necessary to control drying and shrinkage.

3. Protection

1. Protect masonry and other work from marking and other damage. Protect completed work from mortar droppings. Use non-staining coverings.

9. Warranties

1. Warrant in accordance with Division 1 requirements.

10. Building Systems Requirements

1. The work described by this Section is related to the following Building Systems as defined in Section 019010. Comply with requirements for performance, review and co-ordination of such systems:
  1. Building Structural System.
  2. Environmental Separation System.
  3. Exterior Finishes Systems.

**2. PRODUCTS**

1. Masonry materials are described in related Division 4 Sections of the Specification.

**3. EXECUTION**

1. For requirements for Workmanship refer to Sections 040300 and 040306.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division One, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.

### 2. Related Requirements

1. Common Work Results for Masonry Section 040500
2. Masonry Work Division 04

### 3. References

1. As described in Section 040500.

### 4. Identification of Building Systems

1. As described in Section 040500, as if repeated herein.

## 2. PRODUCTS

1. Burned Clay Brick: To requirements of CSA A82. Type: Type S, Exterior Grade, Compressive strength: 1 [A], Size: to match existing, Colour and texture: to match existing. Maximum 24 hour cold water absorption: 8%. Maximum Saturation Coefficient: 0.78.
2. Existing Bricks for Reuse: Use only hard, sound, and clean salvaged bricks only with Consultant's acceptance. Use only bricks without evidence of soluble salts, and that are compatible in appearance and performance with existing.
3. Exposed units shall be uniform in size, free of perceptible warp or twist, without chipped, ragged or broken edges; have a uniform surface textures, free of cracks, blemishes or defects detrimental to appearance or performance.
4. Provide special units to suit specific conditions, including but not limited to soldier coursing, lintels, and similar, to match existing patterns and sizes.
5. Mortars and Grouts: in accordance with Section 040310.

## 3. EXECUTION

### 1. General

1. Conform to requirements of other Sections of Division 4, and Masonry Procedures as described in Section 040500, including tolerances specified therein and in other sections of Division 4.

### 2. Examination

1. Verification Site Conditions including all masonry.
2. Inform Consultant in writing areas of deteriorated masonry not previously identified.
3. Check for evidence of repairs, cracks, moisture, soluble salt contamination and other defects, and report to Consultant prior to starting Work. Stop work in that area and report to Consultant immediately evidence of hazardous materials.

### 3. Brick removal

1. Identify deteriorated and salvageable bricks.

2. Remove identified areas of deteriorated or salvageable brickwork as follows, taking care not to damage edges or face of bricks to be salvaged:
  1. Rake out face of mortar joints
  2. Cut through unsupported load bearing brickwork in accordance with accepted methods.
  3. Cut out non-load bearing brickwork in length as practicable, and in accordance with accepted method of masonry repairs.
  4. During removal, protect sound areas to remain.
  5. Remove adhered mortar from surface of adjacent bricks that remain in place.
4. Brick Salvage
  1. Carefully clean, and store bricks for re-use.
5. Raking Joints
  1. Use manual raking tool to obtain clean masonry surfaces.
    1. Remove deteriorated and adhered mortar from masonry surfaces to sound mortar, full depth of deteriorated mortar but in no case less than 20 mm leaving square corners and flat surface at back of cut.
    2. Clean out voids and cavities encountered.
  2. Where use of power tools to remove mortar is deemed appropriate, and accepted by Consultant:
    1. Rake out using maximum 86 mm diameter blades to centre of joint only, to a maximum depth that is equal to half of the joint width. Mortar must remain on each side of saw cut. Raking must not touch masonry units.
    2. Stop saw cut 50 to 75 mm from end of vertical and discontinuous horizontal joints. Do not cut into masonry units.
    3. Notify Consultant to review raking, prior to removing remaining mortar with hand tools.
    4. Remove remaining mortar with hand tools.
  3. Remove mortar without chipping, altering or damaging masonry units.
  4. Clean surfaces of joints in accordance with elsewhere in Division 04.
  5. Flush open joints and voids; clean open joints and voids with low pressure water and if not free draining blow clean with compressed air.
  6. Leave no standing water.
6. Repointing
  1. Repoint in accordance with accepted methods and procedures, and as described elsewhere in Division 04.
7. Cleaning
  1. Clean in accordance with accepted methods and procedures.
8. Protection
  1. Protect Work from damage and environmental conditions.
  2. Protect adjacent finished work against damage which may be caused by on-going work.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division One, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.

### 2. Related Requirements

- |                                      |                              |
|--------------------------------------|------------------------------|
| 1. Cast-in-Place Concrete            | Division 03                  |
| 2. Architectural Metals Fabrications | Section 057000               |
| 3. Wood, Plastic, and Composites     | Division 06                  |
| 4. Thermal and Moisture Protection   | Division 07                  |
| 5. Fire and Smoke Protection Systems | Section 078400               |
| 6. Painting and Coating              | Section 099000               |
| 7. The Mechanical Divisions          | Divisions 20, 21, 22, and 23 |
| 8. The Electrical Divisions          | Division 26                  |

### 3. Submittals

1. Submit in accordance with Division 1 requirements:

1. Detailed shop drawings showing articles to be fabricated, including any shop work for holing, forming, and preparation. Submit drawings, designs, and details for guards, stairs, ladders, railings and similar bearing the stamp of a structural engineer licensed to practice in the Province of Ontario.
2. Show profiles, members, fastenings, thicknesses, finishes and other pertinent data.

### 4. Schedule of Items Required by the Contract and Described by this Section

1. Provide all articles, materials, equipment, labour, transportation and incidentals noted, specified, or reasonably inferable as required, to complete the supply and erection of all metal fabrications work of the Contract Documents, except as described in Section 057000.
2. Carefully examine the Contract Documents to ensure that all metal fabrications are provided.
3. Brackets for device, equipment, service piping and conduit mounting are described in the Mechanical and Electrical Divisions. Contractor shall co-ordinate division of work between Trade Contractors for support and fastening of equipment and systems for the Facility Plumbing Systems, the HVAC System and the Electrical Systems. Provide all items necessary for the Work.
4. Provide all metal fabrication items shown on the drawings, and as specifically mentioned in this specification, including but not limited to the following:
  1. Support angles between joists or structural steel for hanging of mechanical or electrical equipment where not described elsewhere.
  2. Anchors bolts and bearing plates where not described elsewhere.
  3. Sleeves and other inserts to built into concrete and masonry elements and required for anchorage and support of metal fabrications.
  4. Bases and levelling plates where not identified elsewhere.
  5. Bearing plates where not identified elsewhere.
  6. Bracing where not identified elsewhere.
  7. Support Brackets where not described elsewhere.
  8. Lintels over masonry openings and masonry lateral support brackets.
  9. Concrete anchors where not shown on structural drawings or supplied by other trades.
  10. Shop primer and field touch-up of both welds and damaged areas.
  11. Connections for all miscellaneous steel.
  12. Miscellaneous framing members around openings in floors and roofs.

13. Hot-dip galvanizing of steel components provided under this Section, for all exterior elements, and where otherwise indicated.
  14. Sleeves for mechanical or electrical penetrations in masonry, sized to suit fire-stopping requirements in addition to size of element passing through sleeve.
  15. Concealed support for finished carpentry items constructed to Section 062000.
5. Supply other Sections with instructions, and if required, templates, necessary for accurate setting of inserts and components. Supply items for building into the work described in other Sections in a timely fashion, in accordance with the Contract Schedule.
  6. Provision of concealed reinforcement members within window system members unless specified in window and entry specification section.
  7. Retaining angles required by fire dampers and fire stops in ductwork are provided by the Mechanical Trade Contractor.
5. Co-ordination with Other Trades
    1. As the Work progresses, supply anchor bolts, templates, bearing plates, straps, and other members required by the Documents to be built into work described elsewhere. Ensure co-ordination, together with the necessary data and drawings for setting.
    2. Co-operate with all engaged in the Work and ensure all necessary instructions and information with regard to materials or items supplied and/or provided as described herein is provided to such forces installing items.
    3. Supply loose lintels and other loose steel members for erection described elsewhere in the Contract Documents.
    4. Materials required to be built in with work described elsewhere in the Contract Documents shall be delivered to cause no delay to that work.
    5. Where work involves penetration of the exterior enclosure, such work shall be performed in close cooperation with enclosure trades and connections shall be designed for movement and tolerances expected in the service life of the connection.
6. Quality Control
    1. Rejections
      1. Defective materials or quality of work whenever found at any time shall be rejected, regardless of previous inspection. Inspection is not to relieve this Contractor from responsibility, but is a quality control procedure for the Owner's benefit and a precaution against oversight and errors. Defective materials shall be removed and replaced by this Contractor at his own expense, without change to the Contract Time.
      2. The work of this section is generally not exposed in the finished Work. Do any work exposed in the finished Work to the standards as set out in Section 057000.
7. Basic Product Requirements
    1. Quality Assurance
      1. Work shall be undertaken by shop forces having the necessary fabrication skills for the items. Submit qualification and experience of shop upon request of Consultant.
      2. Welder Qualifications: certified under CSA W47.1-09 (R2014) for appropriate class of work.
      3. Fasteners to exterior work shall be stainless steel u.n.o.

8. Basic Execution Requirements

1. Delivery, Storage and Handling

1. Deliver, handle and store fabricated components to prevent permanent distortion, corrosion and damage.

2. Protection

1. Provide protective covering as necessary to ensure items are not damaged during shipping, installation, and leave in place until final cleaning of building or until directed by Consultant to remove. Replace items damaged without cost to Owner at Consultant's discretion.
2. Do not shop prime paint or hot-dip galvanise any item on a surface that will be exposed in the finished work unless designated for galvanising. Primers for interior items exposed in the finished work shall conform to the requirements of Section 099000 for metal substrates. Standard steel fabrication shop primer is not acceptable for such items.

9. Warranties

1. Warrant in accordance with Division 1 requirements.

10. Building Systems Requirements

1. The work described by this Section is related to the following Building Systems as defined in Section 019010. Comply with requirements for performance, review and co-ordination of such systems:
  1. Building and Site Structural Systems;
  2. Mechanical and Electrical Systems;
  3. Environmental Separation Systems;
  4. Interior Finish Systems.

## 2. PRODUCTS

1. Materials

1. All structural steel components, to requirements of this section, for fabrication of load-bearing brackets and supports as required throughout the work, and additionally:
2. Steel sections and plate: CAN/CSA-G40.21-13, Grade 300W.
3. Steel tube: CAN/CSA-G40.21-13, Grade 350W.
4. Steel pipe: ASTM A53-12, Type E, Grade A.
5. Sheet steel: hot dip galvanized, cold rolled, with stretcher level degree of flatness to ASTM A653-15; zinc coating designation Z275.
6. Expanded metal lath: flattened expanded carbon steel mesh: Dramex 20 mm #9(10)F.
7. Pipe for sleeves: Schedule 40 black, to suit holing and fire-stopping requirements.
8. Welding materials: CSA W59-13 UP4.

9. Shop coat paint shall conform to requirements of Section 099000 for all steel that will be exposed in the finished work. The Steel Trade Contractor and Contractor are specifically cautioned that shop paints to CGSB standards and normal industry practice are not acceptable for such steelwork.
10. Ferrous Metal Primer for steel not exposed in the finished work: to CAN/CGSB-1.40-M.
11. Zinc rich shop paint: Inorganic Coating No. 5536/5537 by Glidden, Galvafruid by W.R. Meadows, or equivalent product by other manufacturer accepted by Consultant. Field touch up: CAN/CGSB 1.181-02
12. Non-shrink grout: Por-Rok by Hallemite Products Ltd., or SET 15 Minute Anchoring Cement by SET Products Ltd.
13. Stainless steel: ASTM A167 and ASTM A269-15, Type 302 or 304, brushed finish standard, or as indicated on drawings, of sufficient thickness for intended application.
14. Aluminium:
  1. Plate, sheet: AA1100 alloy, anodizing quality.
  2. Extrusions: AA 6063-T5 or T6 alloy.
  3. Aluminium welding material: CSA W59.2-M1991 (R2013).
15. Hot Dip Galvanizing
  1. **Miscellaneous steel for installation in exterior conditions, or for the support of masonry exposed to exterior conditions or pre-cast concrete, including lintels and shelf angles and all other steel exposed to weather after installation, including exterior railings and guards and other material where noted on the drawings shall be hot-dipped galvanized steel to comply with ASTM A123M-15 for irregular sections and ASTM A53-M12 for pipe. Final thickness of zinc coating shall be to minimum 380g/m<sup>2</sup> coating.**
2. Design
  1. Design, detail and supply all connections to develop the strength of connection required by governing codes and the OBC, and additionally to provide the architectural appearance required by the standards of this specification.
  2. Unfilled stitch welds, puddle welds, connection methods that deform members, and other unsightly joint practices are not acceptable.
3. General Fabrication
  1. Fabricate components in the shop in largest size practicable to minimize field jointing.
  2. Where possible, fit and shop assemble work, ready for erection.
  3. Fabricate work square, true, straight, free from warpage and other defects. Accurately cut to required size, with joints closely fitted and properly secured. Machine file and fit joints, corners, copes and mitres.
  4. Reinforce fabricated components to safely withstand expected loads.
  5. Make joints in built-up sections with hairline joints in least conspicuous locations and manner.
  6. Make allowance for thermal expansion and contraction when fabricating exterior work.
  7. Joints shall be welded unless otherwise indicated and unless details of construction do not permit welding. Exposed welds shall be continuously filled, blended, and shall be ground to ensure welds do not appear in the finished work except as radiused changes of material plane.

8. Close exposed open ends of tubular members with welded on steel plugs.
  9. Where work of other Sections is to be attached to work of this Section, prepare work by drilling and tapping holes, as required to facilitate installation of such other work.
  10. Work of this Section, supplied for installation under other Sections, shall be prepared as required ready for installation by: drilling countersinking and tapping holes, forming shapes and cutting to required sizes.
  11. Grind off mill stampings and fill recessed markings on steel components left exposed to view.
  12. Clean and prepare structural steel members for finishing. Exposed members shall receive preparation to EASS Category 3.
  13. Follow recommendations of AISI Committee of Stainless Steel Producers when fabricating, joining, welding, and finishing stainless steel components. Remove heat discolourations with mechanical, chemical or electrochemical means. Provide temporary protective coverings of all stainless steel components.
  14. Ensure exposed edges and connections that are exposed in the finished installation are reviewed and accepted by the Consultant prior to beginning fabrication work.
  15. All work for exterior service shall be designed so that interior of members has continuous venting and gravity draining for galvanizing purposes, to strict recommendations of Galvanizer's Association for locations and area of venting and draining to ensure complete galvanizing of article to interior and exterior of members. Design venting and drainage to assist in draining moisture from within members in the finished Work.
4. Metal Deck – Not applicable this project.
  5. Steel bracing for Interior Architectural Elements and Miscellaneous Items
    1. Fabricate all miscellaneous items, including anchorage and built-in brackets and plates, as indicated in drawings, as identified in the schedule of items described in this Section, and as reasonably inferable as necessary for the completion of the Work.
    2. Provide miscellaneous inserts, clips, and brackets for anchorage of windows, doors and frames, where not supplied by the frame, door, or window supplier.
  6. Bollards – Not applicable this project.
  7. Masonry Lateral Support Brackets
    1. Fabricate masonry lateral support brackets in sizes, shapes and quantity required to meet requirements of OBC and CSA A370-14.
    2. Provide support brackets to all existing masonry walls not supported to requirements of the masonry code, or where modifications to existing openings require replacement of existing supports and/or lintels.
  8. Steel Ladders – Not required this project
  9. Finishes
    1. Thoroughly clean steel of loose scale, rust, oil, dirt and other foreign matter. Suitably prepare steel surfaces by power tool cleaning to receive specified finishes.
    2. Grind smooth sharp projections.
    3. Remove oil and grease by solvent cleaning.

4. Apply coatings in the shop and before assembly. Where size permits, galvanise components after assembly.
  5. Hot dipped galvanize (unpassivated) components where so indicated after fabrication in accordance with requirements of ASTM A123M-15, minimum coating weight 380g/m<sup>2</sup>.
  6. Galvanizing: hot dipped Z275 galvanizing with zinc coating only for items not exposed in the finished work.
  7. Shop apply coat of primer to interior components after fabrication except where stainless steel, galvanized, or zinc rich paint finish is required.
  8. Exterior components except where required to be hot dip galvanise: blast clean metals to "Near White Grade" (SSPC-SP-10) and spray apply a coat of zinc rich paint maximum 3 mils thick.
  9. Bituminous paint: to CAN/CGSB-1.108, for backpaint of surfaces hidden in the work.
10. Isolation Coatings
1. Apply coat of bituminous enamel to contact surfaces of metal components in contact with cementitious materials and dissimilar metals.
11. Bollard Covers – Not applicable this project.

### 3. EXECUTION

1. General
  1. Supply all required metal fabrications as listed herein, as indicated on drawings, and as reasonably inferred as necessary for the complete and finished Work, for installation in conjunction with the work described in other sections of the specification.
  2. Install all miscellaneous framing revisions to structural systems and make all connections.
2. Schedule of Miscellaneous Connector and Fastening Items
  1. Supply deformed anchor bolts, fastening inserts and other similar items for casting into concrete foundations, as indicated on drawings and necessary for the Work.
  2. Door hardware supply is by cash allowance. Supply any inserts required for fastening of hardware, for building in or fastening to masonry or wood, as the case may be. Supply items such that they will not be exposed in the finished Work.
  3. Supply clip angles in steel and/or aluminium as required to ALL door and window frames and thresholds.
  4. Fabricate and provide bollards as detailed, with plastic cover.
  5. Fabricate and provide loose steel beams complete with support brackets for casting into concrete and strap anchors for connection of steel beams to wood framing.
3. Installation
  1. Install components plumb, square, straight and true to line. Drill, cut and fit as necessary to attach this work to adjoining work.
  2. Provide temporary supports and bracing required to position components until they are permanently anchored in place.

3. Securely anchor components in place; unless otherwise indicated, anchor components as follows:
  1. To concrete and solid masonry with expansion type anchor bolts.
  2. To hollow construction with toggle bolts.
  3. To thin metal with screws or bolts.
  4. To thick metal with bolts or by welding.
  5. To wood with bolts or lag screws.
4. Provide all components required for anchoring. Make anchoring in concealed manner wherever possible. Make exposed fastenings, where approved by Consultant, neatly and of same material, colour, texture and finish as base metal on which they occur. Keep exposed fastenings evenly spaced.
5. Dissimilar metals and metals in contact with cementitious elements shall have contact surfaces coated with bituminous paint or be isolated by other means as accepted by the Consultant.
6. After installation, clean and refinish injured finishes, welds, bolt heads and nuts. Refinish with zinc rich paint or primer to match original finish.
7. Upon Substantial Performance of work, or when directed by Consultant, remove protective coverings from finished metal components.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.
2. The Work of this Section includes all Non-penetrating roof safety railing systems, Delta Prevention VSS Compact system.
3. The Safety Railing Systems described by this Section shall not be used as Temporary Measures during installation of roofing systems.

### 2. Related Requirements

- |                                    |                |
|------------------------------------|----------------|
| 1. Environmental Separation System | Section 070500 |
| 2. Modified-Bitumen Roofing        | Section 075200 |
| 3. Sheet Metal Flashings and Trim  | Section 076200 |
| 4. Roof Accessories                | Section 077200 |

### 3. Submittals

1. Submit in accordance with Division 1 requirements:
  1. Product Data: Manufacturer's data sheets on each product to be used, including:
    1. Preparation instructions and recommendations.
    2. Storage and handling requirements and recommendations.
    3. Installation methods.
  2. Shop Drawings:
    1. Including but not limited to indication of full layout, profiles, sizes, connections, sizes and types of fasteners and accessories; showing fabrication and installation of handrails and guardrails including but not limited to plans, elevations, sections, details of components, anchor details, and attachment to adjoining units of work.
    2. Shop drawings MUST bear the stamp of a Structural Engineer licensed to practice in the Province of Ontario.
  3. Submit field review reports by shop drawing Structural Engineer, as the work progresses, and of final installation of all safety railing systems.

### 4. Reference Standards

1. National Building Code of Canada (NBC), 4.1.5.14 Loads on Guards
2. Occupational Safety and Health Administration (OSHA)
  1. 1926.502 - Fall protection systems criteria and practices.
  2. 1910.23 - Guarding Floor and Wall Openings and Holes.

### 5. Quality Assurance

1. The minimum specified horizontal load applied inward or outward at the minimum required height of every required guard shall be a concentrated load of 1.0 kN (225 lb) applied at any point.

2. Individual elements within the guard, including solid panels and pickets, shall be designed for a load of 0.5 kN applied over an area of 100 mm by 100 mm located at any point in the element or elements so as to produce the most critical effect.
6. Basic Product Requirements
  1. Delivery, Storage, and Handling.
    1. Deliver, store and handle materials and products in strict compliance with manufacturer's instructions and recommendations and industry standards. Store materials within absolute limits for temperature and humidity recommended by the manufacturer.
    2. Protect finishes from damage.
7. Basic Execution Requirements
  1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by the manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
  2. Field Measurements: Where handrails and railings are indicated to fit to other construction, check actual dimensions of other construction by accurate field measurements before fabrication; show recorded measurements on final shop drawings.
  3. Where field measurements cannot be made without delaying the railing fabrication and delivery, obtain guaranteed dimensions in writing by the Contractor and proceed with fabrication of products to not delay fabrication.
8. Contract Closeout
  1. Provide operation and maintenance data for all roof accessories to include in maintenance manual in accordance with Section 018050.
9. Coordination
  1. Coordinate layout and installation of roof safety rail systems with roofing membrane, cants and flashings, existing and new penetrations, existing roof vents, openings, and contrasting pathways. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.
  2. Do not install permanent safety rail systems until after flood testing of roofing systems has been completed, verifying no leaks, and all deficiencies corrected.
10. Warranty
  1. Warrant in accordance with Division 01 requirements. Accessories shall be warranted by the Contractor and Supplier and Roofing Trade Contractor in accordance with the manufacturer's warranty, except that the warranty shall be on a replacement basis where Product is defective.
11. Building Systems Requirements
  1. The work described by this Section is related to the following Building Systems as defined in Section 019010. Comply with requirements for performance, review and co-ordination of such systems:
    1. Building Structural System.
    2. Environmental Separation System.
    3. Exterior Finishes Systems.

## 2. PRODUCTS

### 1. Acceptable Manufacturers

1. Delta Prevention Inc., located at: 4000A Place de Java, Brossard, Quebec, Canada; Toll Free 1-844-855-4273; Email: info@deltaprevention.com.
2. Requests for substitutions will be considered by request during the bidding period.

### 2. Non-penetrating Roof Safety Railing System

1. Non-penetrating rooftop guardrail systems as designed and manufactured by Delta Prevention, VSS compact system. Permanent, modular, free-standing, roof edge railing system that does not penetrate the roofing system. Provide components including but not limited to pipe railings, uprights, bases, weights, fittings and accessories as indicated or required to match design indicated on Drawings and to provide complete installation,

#### 2. System Compliance

1. Canadian National Building Code 4.1.10.1(1)(e), 4.1.10.1(2), 4.1.10.1(4).
2. Ontario Building Code 3.3.1.17. and 4.1.5.14
3. OSHA Standard 29 CFR 1926.502.

#### 3. System Design - Designed for applications with flat roofs.

##### 1. Bases: Weighted base connector with recycled rubber counterweight.

1. Materials: galvanized malleable cast iron
2. Materials: 100% recycled rubber
3. Weights: One weighted base connector with recycled rubber counterweight at every vertical post, maximum post spacing of 10' (120")
4. Weights: One weighted base connector with recycled rubber counterweight at every corner.
5. Terminations: One 5' (60") full height return at each end with one weighted base connector with recycled rubber counterweight.
6. Weights: maximum counterweight allowable height: 6"

##### 2. System Configuration: As indicated on Drawings.

##### 3. Top and Intermediate Rails and Vertical Support Rails: anodized T-6061 aluminium, outside diameter: 1.9", wall thickness: 0.120"

##### 4. Fittings: Galvanized malleable cast iron.

##### 5. Hardware: 18-8 stainless steel.

##### 6. Components: As scheduled and indicated on Drawings, as required to match design indicated on Drawings and as required to provide complete installation.

### 3. Fabrication

1. Fit and shop assemble components in largest practical sizes for delivery to site.
2. Upright tops shall be plugged with weather and light resistant material.
3. Assemble components with joints tightly fitted and secured. Accurately form components to suit installation.

### 3. EXECUTION

#### 1. Examination

1. Prepare substrates using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
2. If preparation is the responsibility of another installer, notify the Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.

#### 2. Installation

1. Install in accordance with manufacturer's instructions including the following:
2. All set screws must be set to 30 lb/ft except the GA201-10 composing the vertical post that must be set to 20 lb/ft.
3. Maximum distance between vertical posts must be respected in all configurations.
4. Non-penetrating guardrail must be installed 12" from the edge when there is no parapet wall and additional returns every 40' are needed on the VSS Compact only.

#### 3. Field Review

1. The shop drawing engineer shall perform regular field review during construction and shall submit field reports to Consultant

#### 4. Protection

1. Protect installed products until completion of project.
2. Touch-up, repair or replace damaged products before Substantial Performance.

#### 5. Cleaning

1. Upon completion of work of this section, examine roof areas carefully and remove all loose metal, fasteners, and other debris. Use magnetic detector. The Contractor shall reimburse Owner for any work Owner or Consultant performs to pick up loose fasteners or metal, howsoever left. To avoid these charges, the Contractor shall inspect the roof each time a trade contractor performs work to the roof areas, whether existing areas or new. Maintain roofs during the construction period at no cost to Owner.
2. Check drains to ensure cleanliness and remove all debris and loose fasteners.
3. Remove all metal and waste debris from roof surface by thoroughly checking all areas.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.

### 2. Related Requirements

- |   |                |
|---|----------------|
| 1. Work Related to Existing Building    | Section 011030 |
| 2. Removals                             | Section 024119 |
| 3. Metal Fabrications                   | Section 055000 |
| 4. Rough Carpentry                      | Section 061000 |
| 5. Finish Carpentry                     | Section 062000 |
| 6. Architectural Woodwork               | Section 064000 |
| 7. Solid Surface Fabrications           | Section 066100 |
| 8. Environmental Separation System      | Section 070500 |
| 9. Sealants                             | Section 079000 |
| 10. Interior Finishes System            | Section 090500 |
| 11. Non-loadbearing studs and boardwork | Section 092000 |
| 12. Resilient Flooring                  | Section 096500 |
| 13. Painting and Coatings               | Section 099000 |

### 3. Submittals

1. Submit in accordance with Division 1 requirements:
  1. Detailed shop drawings showing articles to be fabricated, including any shop work for holing, forming, and preparation. Submit drawings, designs, and details for guards, stairs, ladders, railings and similar bearing the stamp of a structural engineer licensed to practice in the Province of Ontario.
  2. Show profiles, members, fastenings, thicknesses, finishes and other pertinent data.

### 4. Schedule of Items Required by the Contract and Described by this Section

1. Provide all articles, materials, equipment, labour, transportation and incidentals noted, specified, or reasonably inferable as required, to complete the supply and erection of all architectural metal fabrications work to the extent of the Contract Documents.
2. Carefully examine the Contract Documents to ensure that all architectural metal fabrication items are provided.
3. Provide all architectural metal fabrication items shown on the drawings, and as specifically mentioned in this specification, including but not limited to the following:
  1. **All new guards and handrails to stairs and ramps**
4. Supply other Sections with instructions, and if required, templates, necessary for accurate setting of inserts and components. Supply items for building into the work described in other Sections in a timely fashion, in accordance with the Contract Schedule.

### 5. Co-ordination with Other Trades

1. As the Work progresses, supply anchor bolts, templates, bearing plates, straps, and other members required by the Documents to be built into work described elsewhere. Ensure co-ordination, together with the necessary data and drawings for setting.

2. Co-operate with all engaged in the Work and ensure all necessary instructions and information with regard to materials or items supplied and/or provided as described herein is provided to such forces installing items.
3. Materials required to be built in with work described elsewhere in the Contract Documents shall be delivered to cause no delay to that work.
4. Where work involves penetration of the environmental separation systems, or fire separation systems, such work shall be performed in close cooperation with other trades and connections shall be designed for:
  1. movement and tolerances expected in the service life of the connection.
  2. fire separation rating requirements.
6. Quality Control
  1. Rejections: Defective materials or quality of work whenever found at any time shall be rejected, regardless of previous inspection. Inspection is not to relieve this Contractor from responsibility, but is a quality control procedure for the Owner's benefit and a precaution against oversight and errors. Defective materials shall be removed and replaced by this Contractor at his own expense, without change to the Contract Time.
7. Basic Product Requirements
  1. Quality Assurance
    1. Work for architectural metal fabrications related to architectural woodwork shall be undertaken by the trade contractor performing the work described in Section 064000 unless specifically noted on drawings for performance by this Section.
    2. The Trade Contractor performing work for railings and guards shall have demonstrated ability for architectural quality work to the satisfaction of the Owner and Consultant. Under no circumstances shall railing and guard work be bid or undertaken by a general miscellaneous steel shop or steel fabricator without specific experience in the provision of OBC requirements, and acceptable finishes and appearances.
    3. All steel work described in this Section are hereby defined as Architecturally Exposed Structural Steel in accordance with the CISC Guide for Specifying Architecturally Exposed Structural Steel (AESS). All work must meet the Guide's requirements and recommendations of either:
      1. Category 3, for all items. All work shall additionally conform to higher standards as set out in Division 1 and this Section, and:
        1. Fastenings/anchors: concealed.
        2. Flatness tolerance: free of perceptible waves, bows, dimples, oil canning and other visual defects.
        3. Joints: straight, tight-fitting, hairline.
        4. Welds shall be ground smooth and shall be continuous to form architectural quality appearance.
8. Basic Execution Requirements
  1. Delivery, Storage and Handling
    1. Deliver, handle and store fabricated components to prevent permanent distortion, corrosion and damage.

2. Protection

1. Cover finished metal surfaces exposed in the final Work with pressure sensitive heavy protection paper or apply strippable plastic coating, before shipping to job site.
2. Leave protective covering in place until final cleaning of building or until directed by Consultant to remove. Provide instructions for removal of protective covering.
3. Do not shop prime paint or hot-dip galvanise any item on a surface that will be exposed in the finished work unless designated for galvanising. Primers for interior items exposed in the finished work shall conform to the requirements of Section 099000 for metal substrates. Shop primer is not acceptable for such items.

9. Warranties

1. Warrant in accordance with Division 1 requirements; and
  1. Warrant all architectural metals against fading, cracking, loss of finish adhesion, or other imperfection becoming apparent within 2 (two) years of Substantial Performance of the Work, in accordance with the General Conditions 12.3.1 and 12.3.4, and further for Product replacement warranties as offered by Product manufacturers.
  2. The only exception to defect shall be wilful damage by users.

10. Building Systems Requirements

1. The work described by this Section is related to the following Building Systems as defined in Section 019010. Comply with requirements for performance, review and co-ordination of such systems:
  1. Barrier Free Path of Travel System
  2. Interior Finish Systems

## 2. PRODUCTS

1. Materials

1. Structural steel components, to requirements of Structural Docs. and this section, for fabrication of load-bearing brackets and supports as required throughout the work, and additionally:
2. Steel sections and plate: CAN/CSA-G40.21-M04 (R2009), Grade 300W.
3. Steel tube: CAN/CSA-G40.21-M04 (R2009), Grade 350W.
4. Steel pipe: ASTM A53-12, Type E, Grade A.
5. Sheet steel: hot dip galvanized, cold rolled, with stretcher level degree of flatness to ASTM A526; zinc coating designation Z275.
6. Perforate sheet steel: to match existing at Dining Hall patron control guard.
7. Pipe for sleeves: Schedule 40 black, to suit holing and firestopping requirements.
8. Welding materials: CSA W59-M13 UP4.
9. Shop coat paint shall conform to requirements of Section 099000 for all steel that will be exposed in the finished work. The Steel Trade Contractor and Contractor are specifically cautioned that shop paints to CGSB standards and normal industry practice are not acceptable for such steelwork.

10. Ferrous Metal Primer for steel not exposed in the finished work: to CAN/CGSB-1.40-M.
11. Zinc rich shop paint:
  1. Shop coat: Inorganic Coating No. 5536/5537 by Glidden, Galvafroid by W.R. Meadows, or equivalent product by other manufacturer accepted by Consultant.
  2. Field touch up: CAN/CGSB 1.181-02
12. Non-shrink grout: Por-Rok by Hallemite Products Ltd., or SET 15 Minute Anchoring Cement by SET Products Ltd.
13. Stainless steel: ASTM A167-99 (2009), ASTM A480, and ASTM A269-15a, Type 302 or 304, brushed finish standard, or as indicated on drawings, of sufficient thickness for intended application.
14. Aluminium:
  1. Plate, sheet: AA1100 alloy, anodizing quality.
  2. Extrusions: AA 6063-T5 or T6 alloy.
  3. Aluminium welding material: CSA W59.2-M1991.
15. Hot Dip Galvanizing
  1. Miscellaneous steel for installation in exterior conditions, or for the support of masonry exposed to exterior conditions or pre-cast concrete, including lintels and shelf angles and all other steel exposed to weather after installation, including exterior stairs, railings and guards and other material where noted on the drawings shall be hot-dipped galvanized steel to comply with ASTM A123M-15 for irregular sections and ASTM A53M-12 for pipe. Final thickness of zinc coating shall be to minimum 380g/ m<sup>2</sup> coating.
2. Design
  1. Design, detail and supply all connections to develop the strength of connection required by governing codes and the OBC, and additionally to provide the architectural appearance required by the standards of this specification.
  2. Unfilled stitch welds, puddle welds, connection methods that deform members, and other unsightly joint practices are not acceptable.
3. General Fabrication
  1. Fabricate components in the shop in largest size practicable to minimize field jointing.
  2. Where possible, fit and shop assemble work, ready for erection.
  3. Fabricate work square, true, straight, free from warpage and other defects. Accurately cut to required size, with joints coped. Machine file and fit joints, corners, copes and mitres.
  4. Reinforce fabricated components to safely withstand expected loads.
  5. Make joints in built-up sections with hairline joints in least conspicuous locations and manner.
  6. Make allowance for thermal expansion and contraction when fabricating exterior work.
  7. Joints shall be welded smooth fillet joints unless otherwise indicated and unless details of construction do not permit welding. Exposed welds shall be continuously filled, and shall be ground to ensure welds are not discernible in the finished work.
  8. Close exposed open ends of tubular members with welded on steel plugs unless specifically detailed otherwise.

9. Where work of other Sections is to be attached to work of this Section, prepare work by drilling and tapping holes, as required to facilitate installation of such other work.
  10. Work of this Section, supplied for installation under other Sections, shall be prepared as required ready for installation by: drilling countersinking and tapping holes, forming shapes and cutting to required sizes.
  11. Grind off mill stampings and fill recessed markings on steel components left exposed to view.
  12. Clean and prepare steel members to EASS Category 3.
  13. Follow recommendations of AISI Committee of Stainless Steel Producers when fabricating, joining, welding, and finishing stainless steel components. Remove heat discolourations with mechanical, chemical or electrochemical means.
  14. Ensure exposed edges and connections that are exposed in the finished installation are reviewed and accepted by the Consultant prior to beginning fabrication work.
  15. All work for exterior service shall be designed so that interior of members has continuous venting and gravity draining for galvanizing purposes, to strict recommendations of Galvanizer's Association for locations and area of venting and draining to ensure complete galvanizing of article to interior and exterior of members. Design venting and drainage to assist in draining moisture from within members in the finished Work.
4. Guards and Railings (a.k.a Guardrails and Handrails)
    1. Design connections of guards to minimize envelope penetrations and to develop lateral resistance strengths to meet OBC requirements wherever guards and railings are adjacent changes in level.
    2. Design penetrations of assemblies so that expected movement and tolerances of such assemblies is allowed in the design, without compromise to structural integrity and envelope performance.
    3. Provide guards to locations shown, and to details, of steel sections. Note that guards and railings within the building must prevent the passage of a 200 mm diameter sphere and shall conform with OBC requirements for industrial facilities in addition to this specification.
  5. Stairs – N/A this Project
    1. Fabricate stairs to detail, and with sufficient stringer depth and strength for particular layout.
    2. Provide all landing framing, deck, and treads to detail and as necessary for the complete work.
    3. Pans shall be fabricated of sufficient material thickness to suit all loading, and for heavy duty loading (4.5 kPa live load) to service stairs. Pans shall have dust and cleaning detail at top of concrete level in each pan, to form bent 45 degree slope to riser.
  6. Foot Rests, Steel Foot Guards – N/A this Project
    1. Fabricate and provide metal foot guards and rests to AESS Category 3, all welds ground smooth, to all locations at underside of counters and cabinetry, wherever shown, for anchoring to floor once floor finishes are installed. Quantity and locations as per millwork drawings.
    2. Provide 1 1/2" (38mm) diameter radiused and galvanized HSS tube (11 gauge) to lengths indicated and to welded 100mm by 100mm steel plate with 6mm thick mild steel (at each tube end). Provide four wedge anchor bolts (3/8"-3.75" wedge anchor at each steel plate and embedded (2.5" embedment) in the concrete floor as required to secure metal guard system to floor assembly. Co-ordinate with floor finish installation.

## 7. Finishes

### 1. Finishes to Architectural Metal Fabrications Generally

1. Thoroughly clean steel of loose scale, rust, oil, dirt and other foreign matter. Suitably prepare steel surfaces by power tool cleaning to receive specified finishes.
2. Grind smooth sharp projections.
3. Remove oil and grease by solvent cleaning.
4. Apply coatings in the shop and before assembly. Where size permits, galvanise components after assembly.
5. Hot dipped galvanize (unpassivated) components where so indicated after fabrication in accordance with requirements of ASTM A123M-15, minimum coating weight 380g/m<sup>2</sup>.
6. Galvanizing: hot dipped Z275 galvanizing with zinc coating only for items not exposed in the finished work.
7. Shop apply coat of primer to interior components after fabrication except where stainless steel, galvanized, or zinc rich paint finish is required. Interior stairs shall have galvanized grating treads or formed steel pan, as detailed, and shall be prepared for concrete infill with galvanized mesh fastened to the pans where stair treads are for concrete infill. Prepare all elements for field painting as described in Section 099000.
8. Exterior components except where required to be hot dip galvanised: blast clean metals to "Near White Grade" (SSPC-SP-10) and spray apply a coat of zinc rich paint maximum 3 mils thick, in coordination with fabricator's finish process to meet this specification.
9. Bituminous paint: to CAN/CGSB-1.108, for backpaint of surfaces hidden in the work.

### 8. Isolation Coatings and Interfaces to Concrete

1. Apply coat of bituminous enamel to contact surfaces of metal components in contact with cementitious materials and dissimilar metals.
2. All exterior railing and guard connections shall be made through 3 mm solid thickness glazing quality neoprene of shore hardness 120.

## 3. EXECUTION

### 1. General

1. Supply all required metal fabrications as listed herein, as indicated on drawings, and as reasonably inferred as necessary for the complete and finished Work, for installation in conjunction with the work described in other sections of the specification.
2. A partial list of items is additionally noted in Part 2. Provide all such items.

### 2. Schedule of Miscellaneous Connector and Fastening Items

1. Supply pipe inserts into exterior concrete to receive new guard, post, and handrail vertical stanchions and support elements
2. Supply bolts connecting inserts and vertical stanchions.
3. Supply all Unistruts, channels, and threaded rods that will be exposed in the finished Work for support of all millwork, signage, light boxes and canopies, and as described in the Documents.

3. Installation

1. Install components plumb, square, straight and true to line. Drill, cut and fit as necessary to attach this work to adjoining work.
2. Provide temporary supports and bracing required to position components until they are permanently anchored in place.
3. Securely anchor components in place; unless otherwise indicated, anchor components as follows:
  1. as detailed, and
  2. Railings and guards shall be installed with epoxy-set anchorage only. Do not use expansion fastenings unless specifically so detailed.
4. Provide all components required for anchoring. Make anchoring in concealed manner wherever possible. Make exposed fastenings, where approved by Consultant, neatly and of same material, colour, texture and finish as base metal on which they occur. Keep exposed fastenings evenly spaced.
5. Dissimilar metals and metals in contact with cementitious elements shall have contact surfaces coated with bituminous paint or be isolated by other means as accepted by the Consultant.
6. Upon Substantial Performance of the Work, or when directed by Consultant, remove protective coverings from finished metal components wherever required for AESS Cat 2 or higher.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.

### 2. Related Requirements

- |  |                        |
|--|------------------------|
| 1. Requirements for Temporary Measures   | Division 01            |
| 2. Rough Carpentry for Demolition Works  | Division 02            |
| 3. Finish Carpentry                      | Section 062000         |
| 4. Architectural Woodwork                | Section 064000         |
| 5. Flashings and Trim                    | Section 076200         |
| 6. Fire and Smoke Protection Systems     | Section 078400         |
| 7. Openings                              | Division 08            |
| 8. Non-Load Bearing Studs and Boardwork  | Section 092000         |
| 9. Specialties, for Blocking and Support | Divisions 10, 11, 12   |
| 10. Mechanical & Electrical Work         | Mech & Elec. Documents |

### 3. Special Project Requirements

1. It is the intent of this Section that rough carpentry work be performed strictly as required to accomplish the construction sequencing and scheduling, in cooperation with the trade contractors performing other aspects of the Work.
2. The work of this section may not proceed as one continuous operation, but in many increments. Include all costs for such an approach to the Work.
3. Provide all carpentry work required by Division 1 of the specification, unless specifically provided by a trade contractor as an integral part of the trade contractor's work. In all cases, regardless of division of Contractor's forces and contracts, all work shall be performed to standards identified in Division 1 and this Section. The Contractor is cautioned that blocking, support, furring, and other items specified for support, necessary for the Work, and required in the Contract are not shown on drawings.
4. The work of this Section includes all materials and work to provide temporary protection of other portions of existing facility, and separation of construction areas in accordance with the Contractor's Construction Plan, the sequencing requirements for the Work, Division 1 requirements, and the Contractor's Safety Plan.
5. Generally, but without limitation, this Section describes work required by the Contract for:
  1. Use of wood to form aids, temporary protection, barriers, guards, ladders, hoardings, scaffolds, dust-tight partitions, weathertight barriers, and other Division 1 requirements.
  2. Selective demolition of wood in existing portions of the facility, and making good adjacent such demolition as described in Section 024119.
  3. Blocking, reinforcement, and provision of wood backup in wall, partition, and ceilings.
  4. Ply substrates behind boardwork and elsewhere for equipment mounting.
  5. Ply sheathing underlayment layers & gussets to partitions, walls and assemblies.
  6. Ply backerboards where not provided by other trade contractors.
  7. Jamb and head reinforcement to rough openings to reinforce openings.
  8. New bucks and reinforcement at interior door openings and screens and windows in steel stud partitions, to strengthen partitions at openings.

### 4. Reference Standards and Codes

1. CSA B111-1974 (R2003) Wire Nails, Spikes and Staples.
2. CAN/CSA-G164-M92 (R2003) Hot Dip Galvanizing of Irregularly Shaped Articles.

3. CAN/CSA-O141-05 Softwood Lumber.
  4. CSA O151-09 Canadian Softwood Plywood.
  5. National Lumber Grades Authority Standard Grading Rules for Canadian Lumber 1991.
5. Basic Product Requirements
1. Quality Control:
    1. Work of this Section shall be undertaken by journeymen carpenters able to demonstrate applicable experience to the satisfaction of the Consultant and the Owner.
    2. Lumber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board, or by sample to acceptance of Consultant together with submittal of product origin.
    3. Plywood identification: by grade mark in accordance with applicable CSA standards.
    4. Materials supplied under this Section shall be selected by Contractor for minimum 50% FSC certified material on a supply cost basis.
  2. Delivery, Storage, and Handling:
    1. Materials must be stored off the grade surface, and supported frequently so as to retain straightness of members. Protect materials from weather using appropriate means, but take care to ensure that materials receive air circulation.
    2. Store materials safely, keeping in mind the possibility of vandalism and climbing by intruders.
6. Basic Execution Requirements
1. Perform execution to the requirements of Division 1.
7. Warranties
1. In accordance with Division 1 requirements and GC12.3.1. and 12.3.4 as amended.
8. Identification of Building Systems
1. The work described by this Section forms components in the Building Structural System and the Interior Finishes System, as defined in Section 019010. Comply with requirements for the integration of the work described in this Section into its roles in these systems. Provide the work so that the performance requirements of the overall system of which it forms part is achieved. Trade contractors shall not proceed in uncertainty regarding the role or requirement of the component in relation to the system. Obtain clarification from the Contractor and the Trade Contractor responsible for the system.

## 2. PRODUCTS

1. Lumber Material
  1. Lumber not exposed in the finished work: unless specified otherwise, softwood, S4S, moisture content 19% or less in accordance with following standards:
    1. CAN/CSA-O141-05.
    2. NLGA Standard Grading Rules for Canadian Lumber.
    3. Lumber shall be S-P-F No. 1 or No. 2. Stud grade not acceptable.
    4. Lumber shall be minimum 50% FSC certified material on a supply cost basis.

2. Plywood:
    1. All locations except backboards: Douglas Fir Ply to CSA 0121-M1978 Un-sanded Sheathing Grade, exterior sheathing grade.
    2. Backboards: Douglas Fir Ply to CSA 0121-N1978, Sanded Grade, solid two sides, fire retardant pressure-treated.
    3. To curved partitions, full solid veneer Baltic ply in 3 mm or 6 mm thickness to suit radius of curves by glue laminating layers of ply.
  3. Furring, bridging, blocking, nailing strips, grounds, strapping, curbs, fascia backing and sleepers, all not to be exposed in the finished work:
    1. CAN/CSA-O141-05.
    2. NLGA Standard Grading Rules for Canadian Lumber.
    3. S-P-F No. 1/2 or better, S-GRN. Commercial and Stud grades are acceptable provided that individual pieces are selected for conformance to higher grades in exposed locations and other pieces are used in concealed locations only.
    4. Materials for these uses may be re-used cut-offs or recycled lumber acceptable for the use intended, or minimum 50% FSC certified material on a supply cost basis.
  4. Structural Wood exposed in the finished work: S-P-F No. 1/2 or better.
  5. Other wood exposed in the finished work: to requirements of Section 062000.
2. Wood Treatment
    1. Preservative pressure treated components: to latest Canada Green Council standards. Use of pressure treated material shall be minimized, and shall be confirmed with the Consultant prior to any use in the Work. Under no circumstances use pressure-treated lumber in areas of pvc membrane roofing or to the interior of the building.
    2. Fire retardant pressure treated components: to CSA 080-M1983 for maximum flame spread of 25 and labelled by ULC. Use for all backboards and boards in IT, Electrical, and Mechanical Rooms.
    3. Surface cut, bore and trim components to sizes required as much as possible prior to pressure treatment.
  3. Accessories
    1. Nails, spikes and staples: to CSA B111, hot dip galvanised steel for exterior work including components located in exterior walls and roofs; bright finish steel in all other locations. Unless otherwise indicated use common spiral flathead nails.
    2. Fasteners and Connecting Hardware:
      1. Bolts, nuts, washers: ASTM A307-14, hot dip galvanized steel.
      2. Connectors, anchors, screws, brackets, spikes: hot dip galvanized structural quality steel.
    3. Screws: to CSA B35.4-1972, zinc, cadmium or chrome plated purpose-made for specific substrates to be joined, Robertson head. In exterior wall assemblies, use deck screws with integral anti-corrosion coatings.
    4. Expansion Bolts: 12mm diameter unless indicated otherwise, c/w nuts and washers.

5. Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead plugs, recommended for purpose by manufacturer, standard for quality, Hilti.
  6. Wood Adhesive: PL Premium gun-grade by Lepage. No substitution.
  7. Threaded Rod: Mild Steel, pre-finished rod c/w washers and double nuts to ASTM A307-14.
4. Finishes
1. Galvanizing: to CAN/CSA-G164-M92 (R2013), use galvanized fasteners for work to building enclosure assemblies.
  2. Bituminous back-paint for surfaces in contact with concrete or masonry.

### 3. EXECUTION

1. Preparation
  1. Treat surfaces of material where applied to concrete or masonry, before installation.
2. Execution of Rough Carpentry
  1. Provide all modifications to existing building openings and wood furring support to other elements as shown on drawings and as necessary for the work.
  2. Reinforce door frame openings with minimum 38 thick lumber from floor to adjacent structure within steel stud walls, to allow clearances for sill, head, and jamb finishes. Do not frame openings in tight to door framing.
  3. Provide blocking and bucks to openings to allow adjacent components to return behind frames as detailed and to stiffen all openings in interior partitions.
  4. Provide backing and support for washroom accessories, whether to existing partitions or new, and whether specifically shown on drawings or not. Include all costs for this work in Contract.
3. Miscellaneous
  1. Install furring and blocking as required to space-out and support wall and ceiling finishes, facings, fascia, soffit, siding and other work as required. Do not install wood products within ceiling spaces used for return air plenums.
  2. Align and plumb faces of furring and blocking.
  3. Install rough bucks, nailers and linings to rough openings as required to provide backing for frames, fitments, screens, Owner's supplied items, window treatments, finish carpentry, millwork, accessories, and other work.
  4. Ensure, in conjunction with the services and related work required by Division 1, all wood hoarding, framed protection, temporary site carpentry, temporary bracing, shoring, ladders, chutes, and other items required for the progress of the Work.
  5. Provide backing within partitions and walls with 3/4" (19mm) ply for mounting of grab bars, toilet accessories, wall guards, corner guards, mirrors and all other miscellaneous specialty or finish items, whether such items are supplied by Owner, by Allowance, or by other Trade Contractors or Suppliers. Pay all costs for this work.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.

### 2. Related Requirements

- |   |                          |
|---|--------------------------|
| 1. Emergency Egress System              | Section 019521           |
| 2. Fire Separation System               | Section 019522           |
| 3. Selective Demolition                 | Section 024119           |
| 4. Rough Carpentry                      | Section 061000           |
| 5. Architectural Woodwork               | Section 064000           |
| 6. Solid Surface Fabrications           | Section 066100           |
| 7. Fire and Smoke Protection Systems    | Section 078400           |
| 8. Joint Protection                     | Section 079000           |
| 9. Steel Doors and Frames               | Section 081113           |
| 10. Hardware to Openings                | Section 087100           |
| 11. Windows                             | Division 08              |
| 12. Non-loadbearing Studs and Boardwork | Section 092000           |
| 13. Acoustic Ceiling Tile Systems       | Section 095100           |
| 14. Painting and Coating                | Section 099000           |
| 15. Interior Building Systems           | Section 101400           |
| 16. Toilet and Shower Partitions        | Section 102100           |
| 17. Wall and Corner Guards              | Section 102600           |
| 18. Washroom and Shower Accessories     | Section 102800           |
| 19. Lockers                             | Section 105100           |
| 20. Owner Supplied Equipment            | Section 110500           |
| 21. Window Shades                       | Section 125000           |
| 22. Window Films                        | Section 125250           |
| 23. Mechanical Equipment & Devices      | Section 20 & Mech. Docs. |
| 24. Electrical Devices                  | Section 26 & Elec. Docs. |

### 3. Submittals

1. Submit in accordance with Division 1 requirements:
  1. Sources of all materials, including fasteners, proposed for use in the Work.
  2. Duplicate samples of all materials, fasteners, Products, and accessories proposed for the Work, including finishes.
  3. Submit detail shop drawings for all panel, sill, trim, and railing work, showing proposed construction for particular items of the Work. Indicate details of construction, profiles, jointing, fastening and other related details. Indicate all materials, thicknesses, finishes and hardware.

### 4. Reference Standards and Codes

1. Ontario Building Code, in its latest Edition.
2. ANSI/DHI A115.IG.94 Installation Guide for Doors and Hardware
3. AWMAC Architectural Woodwork Standards Manual (Edition 2).
4. CSA B111-1974 (R2003) Wire Nails, Spikes and Staples.
5. CSA O115-M1982 Hardwood and Decorative Plywood
6. CAN/CSA O141-05 Softwood Lumber.
7. CSA O151-09 Canadian Softwood Plywood
8. CAN/ULC-S104-15 Fire Tests of Door Assemblies.
9. CAN/ULC-S105-09 Fire Door Frames.

Finish Carpentry

10. ANSI A208.1-1989 Particleboard, Matformed Wood.
  11. National Lumber Grades Authority (NLGA) Standard Grading Rules for Canadian Lumber, latest edition.
  12. National Hardwood Lumber Association (NHLA) Rules for the Measurement and Inspection of Hardwood and Cypress, January 1986.
  13. CAN3-A172-M79 High Pressure Paper Base, Decorative Laminates.
5. Basic Product Requirements
1. Wood materials selected by the Contractor for the work of this Section shall have minimum 50% FSC Certified content, on a supply cost basis.
  2. Protect materials against dampness during and after delivery. Store materials in ventilated areas, protected from extreme changes of temperature or humidity.
6. Quality Assurance:
1. Work of this Section for sill work shall be undertaken by a dedicated millwork and finish carpentry firm with finish carpenters able to demonstrate a minimum of three years applicable experience to the satisfaction of the Consultant and the Owner. Work of this Section shall be undertaken by a firm having shop capabilities, so that items can be pre-fabricated wherever possible. Firm shall be experienced in the production and handling of finish wood grain products, to the satisfaction of the Consultant.
  2. Contractor's hardware technicians and finish carpenters shall be experienced in the installation of door hardware for commercial projects, and shall be experienced in methods of installing all hardware.
  3. Unless otherwise specified, carry out finish carpentry work in accordance with requirements of "Architectural Woodwork Standards Manual" (latest Edition) of Architectural Woodwork Manufacturer's Association of Canada (AWMAC) for Premium Grade, and relevant ANSI/DH1 recommendations.
7. Basic Execution Requirements
1. Cover finished wood surfaces exposed in the final work with heavy protection paper and or protective plastic covering before shipping to job site.
  2. Leave protective covers in place until final cleaning of building or until instructed by Consultant to remove just prior to building occupancy by the Owner.
8. Indoor Air Quality Requirements
1. Requirements for VOC and other characteristics for Products and materials specified in this Section are additionally specified in Section 018080, Indoor Air Quality. Products must conform to these requirements and as follows:
- | <b>Products</b>                 | <b>VOC Limit (g/L)</b> |
|---------------------------------|------------------------|
| Plastic Foam Adhesive           | 50                     |
| Wood Adhesive                   | 30                     |
| Structural Wood Member Adhesive | 140                    |
9. Warranties
1. Warrant the work of this Section in accordance with Division 1 requirements and GC12.3.1 and 12.3.4 as amended, and further in accordance with such provisions against de-lamination of laminate surfaces for a period of three (3) years following Substantial Performance of the Work.

## 10. Identification of Building Systems

1. The work described by this Section forms components in the following Building Systems as defined in Section 019010. Comply with requirements for the integration of the work described in this Section into its roles in the various systems. Provide the work so that the performance requirements of the overall system of which it forms part is achieved. Trade contractors shall not proceed in uncertainty regarding the role or requirement of the component in relation to the system. Obtain clarification from the Contractor and the Trade Contractor responsible for the system, as set out in Section 019010:
  1. Emergency Egress System, to provide installation of components of that system, as described in Section 019521
  2. Fire Separation System, to provide installation of components of that system, as described in Section 019522
  3. Environmental Separation Systems, to provide installation of components of those systems, as described in Section 070010
  4. Interior Finishes System, to provide components of that system to the quality and performance standard required by this Contract.

## 2. PRODUCTS

### 1. Materials

#### 1. Lumber

1. Interior hardwood to walls and where indicated: moisture content 8% or less, soft maple.
2. Hardwood for other uses shall be soft maple unless otherwise noted, 6 to 8% moisture content, selected for straightness.
3. Softwood shall be used in concealed interior locations only, No. 1 white pine, selected to be free of knots and checks..

#### 2. Panel Materials

1. Hardwood plywood: to CSA 0115 M1982, Type II; face veneer: AWMAC Architectural Grade maple, for medium stain finish to Consultant's selection, unless otherwise shown; provide Provide Sound Grade where paint finish is required.
2. Softwood plywood: to CSA 0151 04 Sanded Grade, Solid Two Sides. Use in concealed locations only.
3. Melamine coated Particleboard: ANSI A208.1, minimum density of 700 kg/m<sup>3</sup>. Low VOC, Flakeboard TFM Collection, WF205 Teresina with min 10 mm thick hardwood edge of species capable of accepting stain and finish to match grain and finish of dark walnut.
4. Medium density fibreboard (MDF): ASNI A208.2 minimum density 750 kg/m<sup>3</sup>. Low VOC.
5. Site Sign Material: commercial grade exterior sign backing board, min. 19mm thick, 2.4 m by 1.2 m sheets, Sintra or equivalent, suitable to receive project sign graphic printing by commercial sign shop.

#### 3. Plastic laminated Components

1. Plastic laminate facing sheet: ANSI/NEMA/LD3-2005 Grades HGS and VGS; colours, gloss and texture selected by Consultant from full range of products by Formica, Arborite, Wilsonart, Pionite, Octolam.

2. Backing sheet: BKL Grade by manufacturer of facing sheet.
  3. Laminating adhesive: CAN3-0112 Series - M1977(R2006), and to recommendations of laminate manufacturer.
  4. Core sealer: clear, water resistant synthetic resin type.
  5. PVC-edging for leading edge of melamine particle core shall be 3 mm, solid colour to match melamine coated particle core, to edges exposed in the work for ceiling reveals and bulkheads.
4. Composite Wood and Agri-fibre
    1. All composite wood and/or agri-fibre products (including core materials) used in the building must not contain added urea-formaldehyde.
    2. Adhesives used to fabricate laminated assemblies used in the building that contain composite wood and/or agri-fibre products must not contain added urea-formaldehyde.
    3. Upon request, submit supporting documentation for all composite wood and agri-fibre products used in the building.
5. Accessories
    1. Nails and staples to CSA B111-1974, galvanized for exterior and envelope applications: as reviewed and accepted by Consultant for particular installation application for concealed fastening.
    2. Screws: zinc, cadmium or chrome plated steel as reviewed and accepted by Consultant for particular installation application for concealed fastening. Screws shall be Robertson head.
    3. Adhesive: gun-grade PL Premium by Lepage. No substitution.
    4. Silicone: pure silicone gun-grade by Dow Corning, GE or equivalent, to 079000.
    5. Adhesive Tapes: Tesa 51970 or 3M automotive panel tape. No substitute.
    6. Aluminium and steel brackets and angles: to requirements described in Section 057000 for architecturally exposed steel, and as required to form support and detailing for sills, bulkhead reveals and similar.
6. Wood Finishes
    1. To 099000 and as follows: Stain for penetration of soft maple and existing Stair no.905 wood balustrades, trims, baseboards and guards, to produce dark tones, with further clear finish urethane by Spar or equivalent to all interior clear or stained wood. Site finished by this trade contractor, not by painting trade. Low lustre.
7. Project Sign
    1. Project Sign (4 by 4 foot) shall be supplied to the Contractor by the Owner for erection on independent 4 by 4 nominal posts, installed to depth within grade. Contractor supplies all products and materials necessary for the installation of this sign.
    2. Products and materials for the Project Sign shall be supplied by the Contractor in Contract.
    3. All products, signs and materials required for temporary signage to direct construction deliveries, for safety, and for organization of construction traffic shall be supplied by the Contractor at no further cost to the Owner, including posts, fastening, and foundations to below grade.

## Finish Carpentry

8. Products and Materials Installed by the Finish Carpentry Trade and this Section but Supplied as Described in Other Sections
  1. Products and materials for door and opening hardware, frames and doors, specialties, Owner's tackboards and similar, and accessories scheduled or required for installation by trained finish carpenters are described in other Section of the Specification.
  2. The Contractor shall supply all fasteners, blocking, french cleats, adhesives and similar to install such items without further cost. Under no circumstances shall supplied items be holed or surface fastened without acceptance in each case by the Consultant. In all cases the use of cup washers and surface fasteners and the use of brad nailing or surface finish nailing with touchup is not acceptable as a suitable fastening or installation method. Use concealed methods to the highest standards of carpentry.

### 2. Fabrication

1. Exposed joints and edges:
  1. Uniformly space exposed joints unless otherwise indicated.
  2. Edge grain shall not be visible; mitre external corners, house internal corners. Secure corners with corrugated metal fasteners. Glue mitred corners.
2. Mechanical fasteners:
  1. Conceal all mechanical fasteners from view in the finished Work.
  2. Face fasten and countersink with plugs only where french cleat, permanent adhesion, and other blind methods of attachment are not possible. Face fastening must be accepted by the Consultant prior to installation, and will require replacement of finished carpentry items where such methods are used in contravention of this Specification.
  3. Where face fastening is pre-accepted by the Consultant, it shall involve countersink screw and bolt heads and fill holes with matching wood plugs cut flush and finished to match adjacent surfaces. Use of finishing nails and wood filler is not acceptable under any circumstance.
3. Cutting and fitting make cut-outs in work of this Section as required to accommodate work of other Sections.
4. Allow all shop fabricated items to off gas minimum one week off site, and deliver to site minimum one week before installation to allow wood to acclimatize.

## 3. EXECUTION

### 1. General

1. Do finish carpentry to Quality Standards and techniques of the Architectural Woodwork Manufacturers Association of Canada (AWMAC), Premium Grade, except where specifically detailed or specified otherwise. Co-ordinate all trim, sill, and finished woodwork of this Section with Section 064000 and 066100 workmanship and appearance.
2. Scribe and cut as required, fit to abutting walls, and surfaces, fit properly into recesses and to suit piping, columns, fixtures, outlets, or other projecting, intersecting or penetrating objects.
3. Form joints with continuous splines and waterproof glues regardless of location, to conceal shrinkage, and with overlaps of plastic laminate surfaces into a slight rabbeted edge of hardwood trim.

Finish Carpentry

4. Position items of finished carpentry work accurately, level, plumb, true and fasten or anchor securely using only concealed methods. No face fastening permitted, except in service rooms.
  5. Design and select fasteners to suit size and nature of components being joined, for biscuited, splined, or otherwise concealed methods except where specific acceptance has been obtained from the Consultant for exposed fasteners in service locations.
  6. Pre-finish all components prior to installation except for minor touchup, either site applied prior to final placement, or in shop. Minor touchup shall occur in the field prior to placement and fastening of components. Pre-finishing involves application of sealer and first coat stain finish to all surfaces, not just exposed surfaces, to ensure that items do not differentially warp in conditions of service. Pre-finish final coats to all surfaces that are exposed in the finished Work.
2. Schedule of Fabrications and Installations
    1. Installation of Steel Doors & Frames
      1. Install steel frames supplied under Section 081113, in conjunction with adjacent rough carpentry, masonry, and partition work.
      2. Install steel doors, and perform all prep for hardware and other items that has not been factory prepared. Ensure all edges are finished in conjunction with the work described in Section 099000, and touchup sealing to areas affected by onsite door prep.
      3. Install all hardware for hinged swinging doors, using fasteners appropriate to context. Perform all door and frame prep required to achieve installation to written recommendations of hardware item supplier unless prep is already factory performed. Install all hardware regardless of whether it is supplied by material cash allowance, by stipulated price in 087000, or supplied by the Owner. Door and frame prep is described under Section 081113, and hardware work is additionally described in Section 087000.
      4. Install these items plumb, level and true, and ensure provision of joint sealers within joints so they are not visible in the finished work.
      5. Co-ordinate with trade contractors to ensure completion of work to door controls, operators, and hardware devices, including such work to existing doors described in Division 8, and Division 26 for door operators. Thoroughly review such sections, and provide all work to complete installations that is not specifically described in such sections, including alterations within existing doors and frame sections.
    2. Installation of Finish Hardware
      1. Install all finish hardware described in Section 087000 or otherwise supplied by Owner, and whether to doors new or existing.
      2. The Contractor is cautioned that cash allowances for the supply of hardware are only for certain portions of the required hardware. Selective demolition work requires the careful removal, storage in marked boxes that shall not leave the site, and reinstallation. Supply of certain hardware is included in the Contract and not in the allowances. Installation of all hardware is in the Contract, and not in the allowances.
    3. Glazing
      1. Install glazing to doors. Set glazing in neoprene blocks and install stops with continuous silicone bed. Install in accordance with Section 088000. Ensure glass in protected openings is installed in accordance with NFPA80 requirements.
    4. Additional and Miscellaneous Owner-Supplied Items

1. Upon Substantial Completion, provide tools, fasteners, and two man-days labour to install Owner-supplied miscellaneous items not identified herein or in other sections to locations of Owner's selection. These items will not require blocking. Locate fasteners on studs and other secure portions of partitions wherever possible.
2. Such items may include Owner's equipment, directional signage, safety signage and code-required signage other than that described in other Divisions and Sections.
5. Installation of Specialties
  1. Assemble and install all miscellaneous specialties and accessories described in Division 10 or supplied by Cash Allowance. Be responsible for inspecting provision of blocking and furring to partitions as described in Section 061000.
6. Installation of Fire-Stopping
  1. Install fire-stopping to 078400, where such work is not done by a separate trade contractor.
7. Installation of Toilet Partitions
  1. Install washroom, shower, and change partitions where such work is not done by a separate trade contractor.
8. Installation of Lockers
  1. Install lockers where such work is not done by a separate trade contractor.
9. Installation of Owner Supplied Equipment
  1. Install owner-supplied equipment as scheduled, and as described in Section 110500.
10. Project Site Sign
  1. Provide a 4'-0" (1.2m) by 4'-0" (2.4m) site sign complete with graphics manufactured by a commercial sign shop, on minimum 3/4" (19mm) exterior sign grade backing. Sign will contain names of consultants, contractor, Owner, major trade contractors, and any other verbiage at the Owner's sole discretion. All production, printing and mounting costs for the graphic and sign are by the Contractor as part of this Contract without further cost to the Owner.
  2. Mount sign to location directed by Consultant.
  3. Provide two 140 by 140 (6" by 6") nominal pressure treated lumber (ptl) posts set into grade to below frost level, with suitable concrete precast footing pad below each post. Provide nominal 6x6 ptl top and bottom rails and cross-bracing as required.
11. Interior Architectural Premium grade sills, trim, ceiling reveals, and railing work.
  1. Provide mockups of all work and shop drawings of all work.
  2. Fabricate to standards, to details, and to satisfaction of the Consultant.
  3. Bookmatch veneers whenever possible.
  4. Provide all sills to interior side of windows, to detail, with solid core ply, plastic laminate finish, and profiled hardwood leading edge, to details shown. Ensure plastic laminate laps the hardwood edge min. 1/4" (6 mm) and hardwood is splined to the ply, all as per notes and detail. Scribe and fit sills to suit window and curtainwall conditions, and to form continuous cover for mechanical piping. Support to sills at curtainwall shall be designed to support seating.

5. Provide all recesses and reveals, wherever so detailed.
3. Finishing, Protection and Final Cleaning shall be performed by This Trade Contractor
  1. Protect installation until finish cleaning, and further until acceptance of the Work by the Owner.
  2. Site finish completed Finish Carpentry items unless shop or pre-finished, in accordance with standards and using techniques and materials described in Section 099000. Co-ordinate bidding of the contract so that finishing of such items is priced once only.
  3. Finishing must occur well before building indoor air quality flush out.
  4. Clean all areas affected by the installation to healthcare standards as set out in Division 1, and turn over to Owner ready for use.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.
2. The standard of workmanship required for all Architectural Woodwork this Contract shall be to CMHC requirements as well as this specification, whichever is more stringent.
3. All staining, coating and finishing of items provided under this Section shall be performed by this Trade Contractor, in shop conditions and prior to delivery to site except when unavoidable because of onsite fitting, to the standards identified in Section 099000.

### 2. Related Requirements

- |                               |                      |
|-------------------------------|----------------------|
| 1. Selective Demolition       | Section 024119       |
| 2. Rough Carpentry            | Section 061000       |
| 3. Finish Carpentry           | Section 062000       |
| 4. Solid Surface Fabrications | Section 066100       |
| 5. Joint Protection           | Section 079000       |
| 6. Finishes                   | Division 09          |
| 7. Mechanical Work            | Mechanical Documents |
| 8. Electrical Work            | Electrical Documents |

### 3. Submittals

#### 1. Submit as described in Division 1:

1. Duplicate samples of all Products proposed for the Work, including finishes.
2. Detailed shop drawings for woodwork showing proposed assembly, connections, anchorage, materials, dimensions, thickness and finishes. Indicate all materials, thicknesses, finishes and hardware. Each item shall be shown in plan, section and elevation, detailed in appropriate scale, clearly displaying all required information. Single line diagrams are not acceptable. Upon request of Consultant, details showing proposed connections for all framing connections exposed in the Work. Indicate specified hardware, including make, model, material, function, finish and other pertinent information.

### 4. Reference Standards and Codes

1. Ontario Building Code, in its latest Edition.
2. ANSI/DHI A115.IG.94 Installation Guide for Doors and Hardware
3. AWMAC Architectural Woodwork Standards Manual (Edition 2).
4. National Lumber Grades Authority (NLGA) Standard Grading Rules for Canadian Lumber, latest edition.
5. National Hardwood Lumber Association (NHLA) Rules for the Measurement and Inspection of Hardwood and Cypress, January 1986.

### 5. Basic Product Requirements

#### 1. Quality Control

1. Work of this Section shall be undertaken by finish carpenters able to demonstrate applicable experience to the satisfaction of the Consultant and the Owner.
2. Carpenters shall be experienced in the installation of casework for public buildings and housing projects, and shall be experienced in methods of splining, scribing, revealing, and blind fastening (French cleat and other similar methods).
3. Unless otherwise specified, carry out finish carpentry work in accordance with requirements of "Architectural Woodwork Standards Manual" (2nd Edition) of

Architectural Woodwork Manufacturer's Association of Canada (AWMAC) Premium Grade. Additionally, provide architectural millwork and woodwork so as to promote and support standards of hygiene and to withstand the cleaning practices of a modern public environments without damage or deterioration to surfaces and materials.

2. Delivery, Storage, and Handling
  1. Deliver, handle, and store fabricated components to prevent any distortion, and damage.
6. Basic Execution Requirements
  1. Cover finished wood surfaces exposed in the final work with a plastic cover before shipping to job site to protect materials against dampness during and after delivery.
  2. Store materials in ventilated areas, protected from extreme changes of temperature or humidity.
  3. Leave protective covering in place until final cleaning and turnover to Owner.
  4. Protect cabinetwork against damage, including damage by excessive changes in moisture content. Maintain minimum storage temperature of 16°C, and relative humidity 25% to 55%. Do not deliver to site until atmospheric conditions within the building stabilize to the conditions likely to be encountered during the service life of the cabinetry.
7. Warranty
  1. Warrant in accordance with Division 1 requirements, and:
    1. At no cost to Owner, the Contractor and the Trade Contractor performing the work of this Section shall remedy any defects in work of this Section due to defects in materials and workmanship, including but not necessarily limited to de-lamination, warping, and other defects detrimental to appearance and/or performance, for a period of three (3) years from date of Substantial Performance in accordance with GC12.3.1 and 12.3.4 except as amended here. It is a given that work fabricated and installed in this Contract will undergo extensive and aggressive cleaning, as a condition of service. This shall not void any warranty.
8. Maintenance Manuals and Materials
  1. Submit as described in Division 1, and brief maintenance staff regarding proper care, cleaning, and general maintenance of architectural woodwork.
9. Indoor Air Quality Requirements
  1. Requirements for VOC and other characteristics for Products and materials specified in this Section are additionally specified in Section 018080, Indoor Air Quality. Products must conform to these requirements and as follows: Wood Adhesive shall have a VOC Limit of 30 g/L.
10. Building Systems Requirements
  1. The work described by this Section is a component of the Interior Finishes System. Comply with requirements for the integration of the work described in this Section into its roles in the various systems. Provide the work so that the performance requirements of the overall system of which it forms part is achieved.

## 2. PRODUCTS

1. Lumber Material
  1. Hardwood lumber: moisture content 8% or less, AWMAC premium grade, NHLA graded kiln-dried hardwood, selected for straightness, soft maple hardwood capable of accepting staining.

2. Panel Material

1. Birch veneer ply for all shelves within units and elsewhere where indicated: top quality solid veneer "Russian" or "Baltic" ply birch veneer, with minor "eye" repairs only to exterior veneer, void-free through sectional cuts, capable of sustaining finishes to edges without hardwood edge-banding where so detailed.
2. Canadian softwood plywood (CSP): to CSA O151-09 (R2014), heavy-duty construction.
3. Hardwood plywood: to CSA O115-M1982 (R2001), good two sides solid veneer ply, species of finish surface as indicated.

3. Laminates – N/A this Project

4. Accessories

1. Nails, staples, screws: as reviewed and accepted for particular installation application for concealed fastening only. Screws Robertson head.
2. Splines and concealed lamello or biscuits: hardwood species
3. Adhesive for Field Work: gun-grade PL Premium by Lepage. No substitution.
4. Adhesive for Cabinet assembly: waterproof and to acceptance of Consultant.
5. Silicone: pure silicone, gun-grade, food grade by GE or equivalent to Section 079000.
6. Aluminium Reglets: clear anodized finish, sized in accordance with drawings, aluminium channel reglets, 1.5 mm material thickness.
7. Steel angles and supports, where detailed for support or reinforcement of millwork units, shall be fabricated from architectural quality steel sections (angles, channels, etc.).

5. Millwork Hardware

1. Provide all millwork hardware in Contract. Hardware is not supplied under any Allowance.
2. Cabinet Hardware: Products listed below are a standard of acceptance. Products by other manufacturers, of equal quality and similar appearance may also be provided subject to review and acceptance by Consultant. All hardware shall be to heavy-duty use and operation. Finish shall be chrome or brushed chrome unless otherwise indicated.
  1. Hinges for 3/4" Doors: off-set type of high quality, 110 degree, soft-close.
  2. Door and Drawer Pulls: D-pull by Richelieu or equivalent.
  3. Drawer Slides: full extension for minimum 45kg (100lbs) load at 20".
  4. Locks: Olympus 078 or National Cabinet Lock C8702 or Corbin CCL 02066
  5. Keying: as directed by Owner.
  6. Push latch: automatic open, magnetic or mechanical by Hafele or Richelieu.
  7. Automatic door bolt for double doors: Hafele 245.58.754.
  8. Flat bolt: 373180 by Richelieu.
  9. Cable grommets: plastic countertop fitting for computer/telephone/power cables, 2-part cable set with spring closure top, 60mm diameter: by Hafele; colour to Owner selection.
  10. Adjustable Support legs: heavy-duty applications, stainless steel construction and finish, 152mm height adjustable, with welded mounting plate; minimum 4 (four) legs per cabinet
  11. Door Bumpers: 3x10mm clear soft Self-Adhesive Richelieu #MP30311.
  12. Magnetic Catches: Heavy-duty, Richelieu #BP30010.

7. Fabrication of Millwork

1. Framing: minimum 3/4" (19mm) full veneer plywood, minimum 2 1/2" (65mm) wide.
2. Case bodies: Gables minimum 3/4" (19mm) plywood. Full backs, minimum 1/2" (13mm)

plywood.

3. Shelving 3/4" (19mm) full veneer Baltic core ply only, leading edge exposed and with slight sanded profile edges. Final fabricated shelves shall be stained and finished with two coats water-borne low lustre clear protective finish. All shelves shall be to several adjustable positions. Drill holes. Do not use recessed metal shelf support systems.
4. Drawer systems: 1/2" (13mm) plywood, heavy duty construction with full extension glides.
5. Casework Doors and Drawer Fronts: 3/4" plywood
8. Solid surface material: in accordance with Section 066100.

### 3. EXECUTION

1. Shop Fabrication
  1. Use blind methods of fastening only. Do not use nails and countersink screws. Shop assemble work for delivery to site in size easily handled and to ensure passage through building openings.
2. Site Installation
  1. Install architectural woodwork to Premium Grade Quality Standards of AWMAC Architectural Woodwork Standards Manual, except where specified otherwise.
  2. Install at locations shown on drawings and details, and with accepted shop drawings.
  3. Position accurately, level, plumb straight.
  4. Installations with exposed fasteners to exterior surfaces of the work will be rejected.
  5. Fasten and anchor millwork securely. Provide heavy duty fixture attachments for wall mounted cabinets and change grooming stations and vanities.
  6. Scribe and cut as required to fit abutting walls and to fit properly into recesses and to accommodate piping, columns, fixtures, outlets or other projecting, intersecting or penetrating objects.
  7. At junction of counter or backsplash and adjacent wall finish, apply small bead of sealant. Install backsplash in full bed of sealant.
  8. Supply and Install temporary 3/4" plywood countertops to millwork where solid surface countertops cannot be supplied and installed prior to project milestone for occupancy of the portion of the facility subject to these renovations. Carefully remove all plywood countertops.
3. Schedule of Woodwork Items
  1. Provide all work for new woodwork shown on drawings, as required to complete installation. The work of this trade contractor shall include all work for integral and provision of solid surface fabrications as described in Section 066100.
4. Cleaning and Protection
  1. Clean all casework completely inside and out. Protect all architectural woodwork from damage until final acceptance.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.
2. Provide solid polymer counters and splashes, as detailed on the drawings.
3. The work of this Section must be performed by a trade contractor working under the Architectural Woodwork Trade Contractor, in direct co-ordination from initial shop drawing stage to the handover of the finished Work.

### 2. Related Requirements

- |  |                          |
|--|--------------------------|
| 1. Rough Carpentry                       | Section 061000           |
| 2. Architectural Woodwork                | Section 064000           |
| 3. Sealants                              | Section 079000           |
| 4. Interior Finishes System              | Section 090500           |
| 5. Non-loadbearing studs and boardwork   | Section 092000           |
| 6. Plumbing Fixtures                     | See Mechanical Documents |
| 7. Electrical and Communications Systems | See Electrical Documents |

### 3. Submittals

1. Submit as described in Division 1:
  1. Duplicate samples of all Products proposed for the Work.
  2. Submit Shop Drawings showing location of each item, dimensioned plans and elevations, large-scale details, attachment devices, edge details, and other components. Show locations and sizes of furring, blocking, including concealed blocking and reinforcement required.

### 4. Protection

1. Countertop surfaces shall be covered with heavy kraft paper, or tops shall be put in cartons for protection during shipment.
2. Protect installed countertop with heavy kraft paper secured in position with masking tape. Do not remove until final inspection.
3. Comply with the printed directions, issued by solid surface Manufacturer.

### 5. Warranty

1. Solid surface countertops and all other solid surface fabrication work shall be warranted by the Contractor and the Trade Contractor performing the work of this Section against warpage or manufacturing defects for a period of ten (10) years from the date of Substantial Performance of the Work. Work showing defects during this period shall be replaced or made good without delay and at no expense to the Owner, in accordance with GC12.3.1 and 12.3.4 as amended and for this period.

### 6. Maintenance Data and Materials:

1. Submit manufacturer's care and maintenance data, including repair and cleaning instructions. Include in project closeout documents.
2. Provide maintenance kit for finishes.

## 7. Building Systems Requirements

1. The work described by this Section is a component of the Interior Finishes Building System. Comply with requirements for the integration of the work described in this Section into its roles in the various systems. Provide the work so that the performance requirements of the overall system of which it forms part is achieved.

## 2. PRODUCTS

### 1. Materials

1. Solid surfacing material shall be cast, nonporous, filled polymer, with through body colour, as manufactured by Wilsonart, or equivalent quick-ship Product by Dupont, Formica, Samsung Staron, or Avonite, and meeting the design and performance requirements as outlined herein and in the Documents.
  1. Thickness: 1/2" (13mm)
  2. Finish: Semi-gloss
  3. Edge: bevelled leading edges as detailed, 1 1/2" (38mm) total thickness
  4. Flammability: Flame Spread Index 0 and Smoke Development Index 5, when tested to CAN/ULC-S102.
  5. Class A to NFPA 101, Life Safety Code
  6. Fungi and Bacteria: Does not support microbial growth as per ASTM G21 & G22
  7. Microbial Resistance: Highly resistant to mould growth as per UL 2824
  8. Colour: Designer White no.D354SL.
2. Joint adhesive: Manufacturer's recommendation to create inconspicuous, nonporous joints.
3. Sealant: Manufacturer's standard mildew-resistant, FDA-compliant, NSF 51-compliant, ULC or UL listed silicone sealant in colours matching components.
4. Conductive tape: Manufacturer's standard aluminium foil tape, with required thickness, for use with cutouts near heat sources.
5. Insulating felt tape: Manufacturer's standard for use with conductive tape in insulating solid surface material from adjacent heat sources.

### 2. Shop Assembly

1. Fabricate components to greatest extent practical to sizes and shapes indicated, in accordance with accepted shop drawings and manufacturer's printed instructions and technical bulletins. Provide products in the largest pieces available and minimize joint-work. Locate joints to surfaces out of primary view wherever possible. Match pattern in materials across joints that continue in the same plane.
2. Form joints between components using manufacturer's standard joint welding adhesive without conspicuous joints. Reinforce with continuously welded strip of solid polymer material, 2" (50mm) wide.
3. Provide cutouts for plumbing fixtures and fittings.
4. Rout and finish component edges with clean, sharp returns.
5. Rout cutouts, radii and contours to template.
6. Smooth and polish all edges.

7. All countertops to receive 3/4" (19mm) plywood substrate.
8. Leading edges: Fabricate to produce 1-1/2" (38mm) bevel leading edge profile. Method of fabrication of leading edges shall be heavy-duty surface-to-surface construction.
9. Splashes: provide back and side splashes against all walls, minimum 4" (100mm) in height.

### 3. EXECUTION

#### 1. Examination of Surfaces and Conditions

1. Commencement of work of this Section shall be deemed acceptance of substrate conditions and hence forward all defects in existing conditions whether existing prior to this Contract or as created by the progress of the Work, as affecting the quality of the work of this Section, shall be rectified by the further work of this Section.
2. Surface and ambient temperatures shall be min. 20°C at a relative humidity between 20% to 80%, for a minimum of 72 hours prior to installation and continually following installation.

#### 2. Installation – General

1. Install work plumb, true and square, neatly scribed to adjoining surfaces.
2. Make allowances around periphery and where fixed objects pass through or project into countertops to permit normal movement without restriction.
3. Form field joints using manufacturer's recommended adhesive, with joints inconspicuous in finished Work. Exposed joints/seams visible from beyond 900 mm shall not be allowed.
4. Reinforce field joints with solid surface strips extending a minimum of 50mm on either side of the seam with the strip being the same thickness as the top.
5. Field cut and finish component edges with clean, sharp returns to achieve shop quality work.
6. Rout radii and contours to template only where necessary to suit tolerances and small field conditions. Cutting of pieces for length shall be performed in the shop.
7. Anchor countertops and fascia securely to base cabinets or other supports, using concealed permanent fastening methods only.
8. Align adjacent countertops and form seams to comply with manufacturer's written recommendations using adhesive in colour to match countertop and matching pattern in surfaces that continue in same plane across the joint.
9. Carefully dress joints smooth, remove surface scratches and clean entire surface.
10. Install countertops with no more than 3 mm sag, bow or other variation from a straight line.
11. At junction of back and side panels to adjacent wall finishes, apply small bead of sealant.
12. Upon completion of installation remove identification marks and clean all surfaces. Protect as specified above.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 01, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.

### 2. Related Requirements

1. The Contractor is specifically cautioned that the Work requires achievement of the performance objectives for building systems described in Section 019010 and this Section. The Contractor shall organise the provision of the components of building systems to achieve the intent of the building system design, and shall provide all products and execution reasonably inferable as necessary to achieve the performance objective.
2. The Contractor shall perform the installation work to meet performance requirements for anticipated service life of the assemblies and shall provide the design of connections and fasteners as set out in Section 017010.
3. The Contractor shall thoroughly review all Sections of the specifications, and all drawings, to ensure that the requirements for execution of complete and functioning Environmental Separation Systems throughout the Work to locations where such systems are identified on drawings or in the specification. The Work requires provision of new systems. All such work wherever indicated is included in the Contract Price and Contract Time.

### 4. In general, environmental separation systems consist of the following components:

1. Dampproofing and/or waterproofing materials to foundations;
2. Rainscreens (cladding) & roofing systems;
3. Four principal continuous barrier subsystems: primary weather barriers, air barriers and vapour retarders, the Weather Barrier Subsystems, and the Thermal Barrier Subsystem;
4. Connections of components within the system;
5. Support elements and connections to the building structural system;
6. Components that organise and protect penetrations and openings in the system to allow for passage of air, light, and occupants in a controlled manner (provided, altered and formed by work of this Contract)

### 5. Requirements for the components of environmental separation systems are additionally described in the following sections:

- |  |                  |
|--|------------------|
| 1. Removals  | Section 024419   |
| 2. Masonry   | Division 04      |
| 3. Steel   | Division 05      |
| 4. Rough Carpentry   | Section 061000   |
| 5. Thermal Barrier System                                  | Section 072000   |
| 6. Weather Barrier Systems                                 | Section 072500   |
| 7. Modified Bitumen Roofing                                | Section 075200   |
| 8. Sheet Metal Flashing and Trim                           | Section 076200   |
| 9. Roofing Accessories                                     | Section 077200   |
| 10. Joint Protection                                       | Section 079000   |
| 11. Window Systems   | Division 08      |
| 12. Requirements for mechanical insulation                 | Division 20 & 26 |
| 13. Requirements for sleeving & penetrations to assemblies | Division 20 & 26 |

### 6. The following related systems and components of related systems provide inputs to and receive outputs from the Environmental Separation System. They are described elsewhere as noted:

- |  |                  |
|--|------------------|
| 1. Building Structural System, providing structural support    | Section 019550   |
| 2. Mechanical Systems, receiving and providing conditioned air | Division 20 & 23 |

7. The Environmental Separation System indirectly affects the Mechanical Systems, affecting system performance (see also Division 20 & 23).

### 3. Definitions

1. *Environmental Separation System* is hereby defined as an interrelated set of assemblies of materials, components, and Products that are exposed to the outdoor environment or ground, or that are separating spaces (or spaces and the ground) that are dissimilar in thermal, moisture, or air quality or pressure properties so as to effectively control the movement of air, moisture, and properties between the two environments.
2. *Rainscreen* is hereby defined as a resistive veneer barrier material combined with a continuous air space to the interior of the barrier that provides for pressure equalisation against environmental forces and allows wind and wind-driven rain to shed in a controlled manner. The exterior components of vertical and soffit assemblies to the building shall be installed as designed rainscreens unless specifically noted otherwise.
3. *Air barriers* are hereby defined as an interrelated set of materials within components and assemblies that form a continuous and effective barrier against the passage of air to or through the envelope assembly, and in particular through the thickness of thermal barriers in envelope assemblies.
4. *Vapour Retarders* are hereby defined as an interrelated set of materials within components and assemblies that form a continuous and effective barrier against the migration of moisture vapour through the envelope assembly.
5. *Thermal Barriers* are hereby defined as an interrelated set of materials within components and assemblies that form a continuous and effective barrier against the migration or transmission of thermal energy through the envelope assembly.

### 4. System Intent

1. The intent of the Environmental Separation System is to achieve continuous and effective separation of the conditioned and tempered environments from the differing and varying environments outside the building and in the ground, using barriers in the wall, roof, and floor enclosure assemblies designed to organise and resist the movement of thermal energy, air, and water or water vapour. The barriers and related components of the assemblies shall be installed to ensure that water and moisture vapour, wherever encountered or created, shall drain to the exterior of the envelope without damage to the assembly.
2. The dividing line in the assemblies between interior and exterior varies in accordance with the relative location of each of the principal barriers within the assembly.
3. The Environmental Separation System may include, either singly or in combination:
  1. Roof Assemblies
  2. Exterior Wall Assemblies
  3. Curtainwall Assemblies and Windows
  4. Slabs-on-grade
  5. Storefront Wall and Entry Systems, and other specialised assemblies
4. The Facility requires separation under varying conditions caused by interrelated weather, climate, occupancy, and use factors, generally consisting of:
  1. ground environment below and adjacent the facility;
  2. lobbies and vestibules and similar separation spaces;
  4. Mechanical Rooms and Service spaces that may have different environments or locations (such as ceiling plenum, rooftop penthouse or upper level mezzanine) from other portions of the Facility; and
  5. the outdoor environment.

5. Pre-Installation Conferences
  1. Schedule during initial phases of project start-up a meeting with the Consultant to review and consider the means and methods proposed by the Contractor for installation of the systems, and to ensure that the location, intent, and requirements of the systems are clearly understood by the Contractor and Trade Contractors who will perform the work related to this system.
6. Sequencing
  1. Plan and sequence work to permit installation of materials in conjunction with related materials so that the performance intent of the systems is achieved. Trades shall strictly conform to sequencing requirements for Environmental Separation Systems. Such requirements shall have primary precedence over all other construction sequences.
7. Submittals
  1. Submit in accordance with Division 01 requirements and:
    1. Acknowledgement to Consultant's satisfaction of review of submittals of other systems as they relate to this system.
    2. Prior to ordering materials submit evidence of conformance of materials to ULC requirements for system components.
8. Co-ordination
  1. The construction superintendent shall review submittals of this and other work to ensure full understanding of the interrelation of components that will achieve the performance of the Environmental Separation Systems. The system is constructed from many differing components and subsystems, and is subject to movement under live load conditions.
  2. Inspection work and co-ordination work required to achieve the requirements of this Section are the responsibility of the Contractor's site superintendent and shall not be assigned to a trade contractor even if portions of the material installation work are so assigned.
9. Reference Standards and Codes
  1. Ontario Building Code requirements for Resource Conservation and Environmental Separation.
  2. Building Envelope Design Guide, National Institute of Building Sciences (NIBS).
10. Quality Control
  1. Performance Requirements
    1. Coordination requirements as described in this Section.
    2. Ontario Building Code requirements for continuous and complete air barrier and vapour retarder shall be achieved except where specifically noted otherwise. Owner may test to reference standards using independent testing firm to evaluate performance.
    3. Where tests of the Environmental Separation Systems are conducted by the Owner's forces of Consultant, such tests shall be paid for from the Inspection and Testing Cash Allowance in accordance with its terms. Where results of tests indicate that installed work does not meet performance requirements, the cost of retesting for conformance after corrective measures shall be borne by the Contractor. Such test may include, but are not limited to:
      - hose stream tests, pressure tests, air leakage tests, thermography or imaging tests; or
      - flood tests other than as required to be performed by the Contractor as an integral part of the Work.

11. Temporary Facilities, Safety Requirements and Environmental Protection

1. Conform and cooperate to ensure requirements for temporary facilities, safety, cleaning and waste management, and environment as set out in Section 16010 and Division 01 are achieved throughout the course of the Work. Provide an appropriate Environmental Separation System for the personnel performing work of this Contract, where required to ensure the safety of such personnel and building occupants.
2. For areas of re-roofing of the existing building, whether by base bid contract or provisional pricing, provide all temporary protection to ensure existing portions of the facility, building, or site are protected from damage from wind or storm conditions that may occur. This includes provision of temporary drainage to suitable locations.

12. Warranties

1. The Contractor, and all trade contractors performing work under this Section, warrant all work to the Environmental Separation System and its subsystems in accordance with Division 1 requirements and the general conditions of the Contract GC12.3.1 and 12.3.4, for 2 years following Substantial Performance of the Work and for such longer periods for aspects of the systems as set out in particular specification Sections.

13. Commissioning

1. Perform commissioning requirements in according with Division 01 requirements to ensure the proper function of components of the system, and the system.
2. Quality control measures and sampling inspections shall be carried out by the construction superintendent at sufficient intervals to determine that the components of the systems are being installed in conformance with the intent and accepted submittals and mockups.
  1. Submit reports to the Consultant detailing these inspections and corrective measures undertaken.
  2. These requirements are in addition to the field review by the Consultants, and inspections by the manufacturers and testing agencies.

14. Building Systems Requirements

1. In addition to the Environmental Separation System, the work described by this Section is related to the other Building Systems as defined in Section 019010 and discussed elsewhere in this Section. Comply with requirements for performance, review, and co-ordination of such relations as set out in that Section.

**2. PRODUCTS AND EXECUTION**

1. General

1. Products and Execution requirements for components of the Environmental Separation System are described in related sections and divisions of the specification, in schedules, and on drawings.

2. Sequencing of Work to Existing Building.

1. All work to Environmental Separation System and its subsystems shall be scheduled in strict conformance with requirements for Sequencing of the Work. This includes multiple mobilizations to minimize disturbance and potential damage to existing portions of the facility, and to facilitate connections, roofing work, and tie-ins.

2. **Sequence re-roofing work to existing portions of the building, in accordance with Owner's requirements for use of occupied facilities and occupancy of spaces below the roofing work. Include all costs for this approach and scheduling of aspects of the work to minimize disturbance and for safety. See also Construction Sequencing Plan, and OBC information and data Matrix.**
3. Execute work as described herein and to achieve performance.
  - 1a. Rainscreen Primary Water Control subsystems:
    1. Note that performance requirements for shedding of rain and resistance to penetration of rain and water are as set out in individual specification Sections for rainscreen cladding and roofing, to supplement requirements of the Ontario Building Code.
    2. All interior surfaces of rainscreen wall cavities shall be installed to shed water to the exterior, using lapping techniques and redundancy such that successive layers of the wall assembly shed downward to the exterior and over other components. The base of all rainscreens shall be installed so that collected water which gravity-drains to the base shall be shed to the exterior through weep holes or openings and across the top of continuous through-wall flashings.
    3. Cladding to all rainscreen wall assemblies shall be fitted with profile and trim closures against the infiltration of water through joints between panels and at trims.
    4. Cladding to all rainscreen wall assemblies shall be fitted with compressible cavity closures installed vertically near building corners, to provide control of differential pressures on different sides of the corner caused by wind pressure and air movement around the building corner.
    5. Below grade the installation of bituminous damp-proofing or waterproofing combined with tight fit of rigid insulation shall be installed to shed water to the exterior of the perimeter assembly.
    6. Note that all windows, entries, doors and frames, and curtainwall systems shall be manufactured and designed as rainscreen systems that are able to mitigate exterior pressure and allow gravity drainage of water in protected cavity spaces. These spaces shall in turn be installed in the enclosure systems such that the internal cavities drain to the exterior with through the wall flashings.
  - 1b. Mass-wall Primary Water Control subsystem:
    1. Note that performance requirements for shedding of rain and resistance to penetration of rain and water may also be set out in individual specification Sections for Masonry, and to supplement requirements of the Ontario Building Code.
    2. All exterior surfaces of mass walls shall shed water to the exterior. The base of all mass walls shall be provided with flashings, reglets, sealants, and as detailed, so that collected water which gravity-drains down the face of the wall to where mass walls meet horizontal assemblies shall be shed across the top of continuous flashings.
    3. Note that all windows, entries, doors and frames installed in mass walls shall be manufactured and designed as rainscreen systems that are able to mitigate exterior pressure and allow gravity drainage of water in protected cavity spaces. These spaces shall in turn be installed in mass walls such that the internal cavities drain to the exterior with through the wall flashings.

2. Air Barrier Subsystem:

Note that performance requirements for control of air movement through the Environmental Separation System are as set out in Section 072500 (as less than  $0.02 \text{ L}/(\text{s}\cdot\text{m}^2)$  when under differential pressure across the assembly of 75 Pa when tested in situ) as accomplished by the work of:

1. Section 072000 for locations where insulations form the primary air barrier;
2. Section 072500 for connections at perimeter of roofing, windows, entries, and curtainwall systems, where connections provide continuity to the primary air barrier & vapour control;
3. Section 072500 where the control of air transmission is provided below cast slabs on grade by a membrane air barrier in combination with vapour retarder;
4. Section 075200 where the roofing system provides the primary air barrier system; and
5. Division 08 for windows, entries, and curtainwall systems where these components are present in the enclosure and provide the barrier line within their assemblies. Minimum 300 Pa test pressure where AW rated windows are specified.

3. Vapour Control Subsystem:

Note that performance requirements for control of vapour transmission through the Environmental Separation System shall be in accordance with building code standards and are as further set out in:

1. Section 072500 where connections at perimeter of spray insulation and at perimeter of roofing and at perimeter of entries and curtainwall systems where the connection provides continuity to the primary line of vapour transmission control and connects other components providing such control;
2. Section 072500 where the control of vapour transmission is provided below cast slabs on grade by a membrane vapour retarder;
3. Section 075200 where the roofing system provides the primary vapour control system; and
4. Division 08 sections for windows, entries, and curtainwall systems where these components are present in the enclosure and provide the line of control within their assemblies.

4. Thermal Control Subsystem:

Note that performance requirements for control of thermal heat gain and loss by conductive transmission through the Environmental Separation System are as set out in:

1. Section 072000 for locations where spray insulation, foam in place insulation, rigid insulation or batt insulation forms the primary thermal control;
  2. Section 075200 where insulation in roofing systems provides primary thermal control; and
  3. Division 08 sections for windows, entries, and curtainwall systems where these components are present in the enclosure and provide the line of control within their assemblies.
5. Co-ordinate work described elsewhere in the Contract to ensure complete and continuous systems to achieve Ontario Building Code objectives for environmental separation and to achieve design intent for energy efficiency and Environmental Separation for each of the four major subsystems for the System.

Where sequencing of construction to achieve this goal requires multiple visits, partial installations, and integrated installations, then sequence and perform the Work as necessary with multiple trades working in close co-ordination.

2. Examination
  1. Examine supports, substrates and work to other building systems to ensure conditions are satisfactory to achieve the performance standards for the work of this Section.
  2. Commencement of the work shall imply acceptance of conditions.
  3. Schedule installation of components in strict accordance with sequencing requirements to achieve performance.
3. Installation of Components
  1. Requirements for installation of products that form components of Environmental Separation Systems are described in related sections and divisions of the specification, in schedules, and on drawings.
  2. All components of the System and subsystems require continuous and positive support to the Building Structural System, including for supplementary framing and surfaces required to achieve such support. Notwithstanding this requirement, the System and subsystems shall be installed to allow for movement that may be reasonably anticipated between components or systems, or through external connections.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division One, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here. Comply with Ontario Building Code Part 5 requirements for resistance to thermal transmission, and the more stringent requirements of this Contract.
2. The work of the Thermal Barrier System shall achieve the thermal performance for all materials based upon their rated thermal performance in situ as matching performance established by manufacturer's test in accordance with OBC standards for such testing.
3. Thermal Barrier System performance at connections across materials and between products shall be established using best principles of thermal break, continuity of system, and detailing for establishment of thermal fills with consideration for movement and tolerance.
4. Penetrations of the Thermal Barrier Systems for structural support of components and for fasteners shall be effectively eliminated wherever possible, and otherwise thermally-broken to achieve the surrounding performance in the system, without exception. In general, all portions of the Building Structural System shall be protected by the Thermal Barrier System.
5. Perform all work to meet requirements of Section 070500 Environmental Separation System.

### 2. Related Requirements

1. The Contractor shall thoroughly review all Sections of the specifications, and all drawings, to ensure that the requirements for execution of complete and functioning thermal barrier system throughout the Work.
2. Glazed units to windows, doors, entry systems and thermal breaks to window frames shall function as thermal barriers. See requirements for performance in the sections of Division 8.
3. Gaps to perimeters of windows shall not be deemed acceptable breaches of the thermal barrier system. The gaps to doors and relief vents specified shall be deemed acceptable breaches of the system only for the gap between door and frame, and door and threshold. Such door gaps shall be suitably protected with weatherstripping and sweeps to minimize infiltration and exfiltration.
4. Air intakes and exhausts are acceptable breaches of the system, only to the interior of ducts or vents. All conduit where open-ended into the interior environment shall be effectively sealed, whether empty or containing wiring.
5. Use of foam-in-place insulation shall be such that it accommodates movement and achieves effective depths for thermal resistance within joints.
6. Note that supply and installation of some materials forming part of the thermal barrier system is further described in other Sections, including but not limited to:
  1. Roofing Assemblies
  2. Wall Assemblies
  3. Floor Assemblies
  4. Doors, Frames, and Windows
  5. Mechanical and Electrical Penetrations

3. Submittals

1. Submit in accordance with Division 1 requirements:

1. Product data, materials descriptions, percentage of recycled materials content, manufacturers certificates. Data must confirm that performance requirements for product in-situ are met or exceeded.
2. Prior to ordering materials submit confirmation in writing indicating compatibility of elements forming laps in the Thermal Barrier Systems and adjacent materials in the assemblies. Include manufacturer's documentation verifying suitability of application for expected application conditions.
3. Prepare onsite mockups of installation conditions and the sequence of installation to demonstrate achievement of the system performance objectives to the satisfaction of the Consultant. Perform this work as an integral part of the curtainwall and wall trade contractors, under the direct supervision of the Site Superintendent.
4. Trade contractors performing work described by this Section shall participate and cooperate fully in the work described by Section 070500 for testing, commissioning, and planning the sequence of installation for the components of the Thermal Barrier Systems.

4. Co-ordination

1. Review submittals of this and other work to ensure full understanding of interrelation of components that will achieve the performance of the thermal barrier system.
2. Note that at times throughout the assemblies the thermal barrier system may be accomplished or assisted by components of the air barrier and vapour retarder (a.b./v.r.) systems, but that installation of each system shall be independently considered. The thermal barrier must work directly in contact with other barrier systems in order that the systems can each perform as intended.
3. Sequence work to permit installation of materials in conjunction with related materials. This includes multiple mobilizations and performance of work to parapets and areas of the existing building, whether by base bid or accepted provisional pricing. Include all costs for the timely scheduling of supply and installations to suit roofing work where insulation is installed to upstands and parapets by the work of this Section, in co-ordination with the work of the Roofing Trade Contractor.
4. Sequence the Work and provide connections across and between the Parts of the Work when they are performed as separate portions of the work schedule, or pre-fabricated, so that the thermal system is complete and continuous in the finished Work.
5. Pre-Installation Conference and Mockups: Schedule during project start-up a meeting with the Consultant to review and consider the means and methods proposed by the Contractor for installation of the systems, in conjunction with Weather Barrier System work. The sequence of installation shall be designed for best longterm system performance. The pre-installation conference shall review and inspect, and potentially test, mockups of select portions of connection assemblies, to confirm procedures, detailing, and installer responsibilities.

5. Reference Standards and Codes

1. Ontario Building Code requirements for thermal resistance of assemblies.
2. ASTM C518, Test Method for Steady State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
3. ASTM C1338, Fungal Resistance.
4. ASTM D2842, Volumetric Water Absorption.
5. ASTM E84, Test Method for Surface Burning Characteristics of Building Materials.

6. ASTM E96, Test Methods for Water Vapour Transmission Rate of Building Materials.
  7. CAN/ULC S770, Long Term Thermal Resistance (LTTR).
  8. CAN/ULC S774, VOC Emissions from polyurethane foam.
  9. CAN/ULC S102, Flame Spread Classification.
  10. CAN/ULC S701, Type 4.
6. Basic Product Requirements
    1. Deliver materials to site in manufacturer's original, unopened packaging, with labels clearly identifying manufacturer, material and expiration date.
    2. Store materials in an area protected from damage caused by freezing and/or overheating, and in accordance with manufacturer's instructions.
    3. Dispose of containers in accordance with manufacturer's written recommendations.
  7. Basic Execution Requirements
    1. Apply materials within acceptable application temperature range determined by manufacturer.
    2. Temporarily protect installed insulation from damage and action of the elements until it is permanently concealed or protected.
    3. Protect all insulation from sunlight and uv-degradation.
  8. Warranties
    1. The Contractor, and all trade contractors performing work under this Section, warrant all work to the Environmental Separation System and thermal Barrier Subsystem in accordance with Division 1 requirements and the general conditions of the Contract GC12.3.1 and 12.3.4, for 2 (two) years following Substantial Performance of the Work.
  9. Identification of Building Systems
    1. The work described by this Section forms components of the Environmental Separation System as defined in Section 070500. Comply with requirements for the integration of the work described in this Section into its roles in the various systems. Provide the work so that the performance requirements of the overall system of which it forms part is achieved. Trade contractors shall not proceed in uncertainty regarding the role or requirement of the component in relation to the system. Obtain clarification from the Contractor and the Trade Contractor responsible for the system, as set out in Section 019010.

## 2. PRODUCTS

1. Rigid Insulation
  1. Dow Styrofoam SM, to thickness indicated, for below grade use, under-slab use, or equivalent Owens Corning or Celfort products, and as follows:
    1. SM40 density for vertical applications, ship-lapped, single layer; and
    2. SM60 density for horizontal application and under-slab, including face of foundations.
  2. Poly-isocyanurate rigid board: Trisotech by Tremco, Sopraiso by Soprema, Paratherm by Siplast, for use in cross-lapped, off-set joint layers of roof insulation for 2-Ply Modified Bitumen Roofing, as described in Section 075200. Supplied and installed by the 2-Ply Modified Bitumen Roofing Trade Contractor. Performance: minimum long term thermal rating of R5.7 per inch (25mm) thickness.

2. Foam-in-place Insulation
  1. At gaps to perimeters of windows and door frames, and to other unacceptable breaches within the thermal barrier system as described herein and elsewhere in the specifications, provide closed cell, low-expansion, foam-in-place urethane insulation. Note that foam-in-place insulation shall not be acceptable as contributing to Weather Barrier Systems. It forms thermal barrier component only.
  2. Purpose-made closed cell foam-in-place urethane for completion of thermal barrier system and final compression of the primary Weather Barrier membrane connections: two components ULC Class 1 (flame spread 25 or less) Froth-Pak 180 Insta-foam by Dow Building Solutions or equivalent. Foam shall supplement, not substitute, lapped and fastened AB/VR membranes.
3. Semi-rigid Insulation
  1. Mineral wool installation for firestopping work is specified in Section 078400.
  2. Mineral wool for acoustic interior partition insulation is specified in Section 092000.
4. Insulation Specified Elsewhere
  1. Particular requirements for insulation are described elsewhere, including but not limited to:
    1. Insulation to form protective cover to underground services, Division 33
    2. Foam-in-place urethane insulation to gaps between construction components used in concert with Weather Barrier connective components, this Section, but installation shall be undertaken in co-ordination with the work described in Section 072500.
    3. Insulation and tapered crickets to Roofing Systems, Sections 075200.
    4. Insulation components of fire stop and smoke seal systems, Section 078400
    5. Insulated exterior steel doors, as manufactured, Section 081113.
    6. Pipe, Duct and Equipment Insulation, Divisions 20, 21, and 23.
    7. Insulation for Electrical, Division 26.
  2. Provision of such insulation shall be by the trade undertaking such work.
  3. All work to the thermal barrier system is subject to mockups and acceptances as set out in Section 070500.
5. Primers or Separation Layers
  1. Primers for all insulation where adhered shall be strictly to recommendations of insulation manufacturer. Conversely, where insulation is required to be kept separate from the adjacent material (in accordance with manufacturer's written recommendations) provide polyethylene separation sheet or separation board at no further cost.
6. Adhesives and Fasteners
  1. Adhesive for polystyrene insulation to recommendations of insulation manufacturer, non-vapour barrier type, such as Bakor Henry 230-21 or approved equivalent.
  2. Adhesives, purpose-made plastic fastening disks, stick clips, and recommended fasteners for mechanical fastening and adhesion of semi-rigid insulation in addition to friction fit at locations where semi-rigid insulation may sag, and to soffit applications.
  3. All fasteners shall be thermally broken type.

7. Air Barriers and Vapour Retarders (Weather Barrier Systems)
  1. Products and materials for air barrier and vapour retarder systems (Weather Barrier Systems) are described in Section 072500. They shall be installed in strict co-ordination with the thermal barrier system, to an agreed sequence established by mockup and site co-ordination meeting.

### 3. EXECUTION

#### 1. Preparation

1. Substrates to receive insulation shall be sound, smooth, dry, free of snow, ice, or frost and free of dust, dirt, oil, grease, debris and other foreign substances. Clean substrates as required.
2. Prepare subgrades for best placement of rigid insulation to underside of slabs formed on grade.
3. Mask and protect adjacent surfaces and elements from damage from application of spray-foam insulations. Provide temporary protection and scheduling of work to ensure that Owner's forces and Contractor's forces are not exposed to off-gassing, noxious odour, or other environmental hazards that may arise from installation procedures.
4. Ensure all materials and detailing are accepted and work conforms to the required sequencing of construction and Schedule for aspects of the Work. This includes but is not limited to work to interior or top of existing parapets and upstand walls where detailed for installation in co-ordination with re-roofing work.

#### 2. Examination

1. Examine substrates and immediately inform Consultant in writing of defects.
2. Commencement of the work shall be deemed as acceptance of substrates and surface conditions.

#### 3. Workmanship

1. Provide under this Section all thermal insulation required except where it is specified to be part of other Sections or is specifically coordinated by cladding systems suppliers and the Contractor as an integral part of the Work described in other sections.
2. Install insulation after building substrate materials are dry, compacted, and level to provide for smooth installation to earth, concrete and other substrates.
3. Install insulation to maintain continuity of thermal protection to building elements and spaces.
4. Fit insulation tight around electrical boxes, plumbing and heating pipes and ducts, around exterior doors and windows and other protrusions.
5. Keep insulation minimum 3" (75mm) from heat emitting devices such as recessed light fixtures, and minimum 2" (50mm) from sidewalls of CAN4-S604 type A chimneys and CAN/CGA-B149.1 and CAN/CGA-B149.2 type B and L vents. Fill gaps with mineral wool insulation.
6. Cut and trim insulation neatly to fit spaces. Butt joints tightly, offset vertical joints. Use largest possible dimensions to reduce number of joints.
7. Offset both vertical and horizontal joints in multiple layer applications.
8. Do not enclose insulation until it has been reviewed and accepted by Consultant.

9. Ensure that potential thermal bridging elements such as concrete, and other materials that may traverse the Thermal Barrier System are considered.
  1. Lap insulation to interior and exterior of concrete at thermal bridges for a minimum length of 4 times bridge width.
  2. Provide tapes and use semi-rigid insulation to isolate throughwall flashings and trims from the interior environment.
10. For spray-insulation, use only equipment recommended by manufacturer.
4. Rigid Insulation to SiteWorks
  1. At site service piping installations where frost cover is deficient, the Site Services Trade Contractor shall provide rigid insulation to ensure smooth, level, and tight fitting insulation cover as indicated on documents and in siteworks specification sections.
5. Rigid Insulation to Foundation Walls Below and to Above Grade – N/A this Project
  1. Make good existing insulation to face of foundation walls where so ever affected by the Work. Install insulation tight to foundation wall and adhere with buttered joints. Install insulation level and true.
6. Under-slab Insulation
  1. Provide rigid insulation boards where scheduled or detailed. Coordinate with footings, slab thickenings, trenches, and to ensure fit of insulation so required. Lay boards tight, on level compacted fill, in conjunction with installation of vapour retarder.
7. Insulation to Roofing
  1. Installation of roofing insulation shall be by the Roofing Trade Contractor, as per Section 075200. Such insulation shall be in accordance with existing conditions and shall be strictly scheduled with the work of roofing and carpentry trades to ensure the sequence of construction and the schedule are achieved. This includes all required multiple mobilizations to suit the sequences and schedule for roofing work.
8. Foam-in-Place Insulation
  1. Install foam-in-place insulation in strict accordance with the agreed sequence of construction and mockup as established for the Environmental Separation System. Ensure that VR/AB Weather Barrier Systems are complete and functional, and accepted by inspection and testing.
  2. Installation shall not impede or take the place of sheet membrane connective flashings that provide the Weather Barrier systems (AB and VR). Foam-in-place insulation shall only be installed after these systems have been established and accepted.
  3. Install foam-in-place insulation to form continuity of thermal barrier system throughout the work, to locations:
    1. where installation of rigid insulation is impractical because of shapes and complexity of adjacent conditions, to supplement holing and notching of rigid insulation;
    2. at underside of roof drains to protect roof drain from potential condensation. Cover the installation with pipe insulation in cooperation with mechanical trade. Foam-in-place insulation shall not be exposed in the finished Work, whether to view or within ceiling spaces. Cover and protect such installations in accordance with Building Code requirements.
    3. to perimeter of frames to openings, taking care not to distort frames;
    4. to fill exterior door frames and gaps below exterior thresholds; and
    5. at further locations as indicated in drawings.

4. Under no circumstances shall foam-in-place insulation be installed to locations in fire separations or acoustic separations requiring firestop or acoustic batt and sealant work.
  5. Urethane foams and sealants are not acceptable as primary Weather Barrier Systems in the completed Work. They are fillers and sealers that protect the membrane Weather Barrier connections, and complete the Thermal Barrier System across and near the membrane installation and to adjacent components. The expansion of the foam assists in compressing the membrane so that it can complete and maintain its permanent seal to adjacent substrates.
  6. Protect adjacent surfaces and surfaces below place of installation prior to beginning foaming work. Ensure that adjacent components of assemblies are installed and firmly anchored so they are not dislocated by the foaming operation.
  7. Use temporary support to interior side of sheet membrane flashing to ensure that foam-in-place installation does not move the primary AB/VR membrane too far to the interior such that returns for sills, jambs and heads at openings cannot fit as detailed.
  8. Install foam from exterior only, in passes filling not more than 1/3 of cavity at any time, and in strict accordance with manufacturer's instructions for ventilation and safety conditions. Allow min. 1 hour between passes so that expansion of previous pass has been substantially achieved.
  9. Do not overfill cavities. Allow for depth of backer rods and sealants and other subsequent work to interior side of membrane flashing loops. Cutting of installed foam is strongly discouraged, and careful application of foam layers in small passes will allow for controlled depths to finished installations within cavities that reduce the need for backer rod work.
  10. Do not stress adjacent assemblies. Provide outlet for foam expansion at all times.
  11. Ensure that foam does not block drainage channels to the exterior. Install foam to all locations and gaps in the Thermal Barrier System and to provide final compression on the AB/VR membrane.
9. Semi-rigid Stone Wool Insulation
1. Mineral wool installation for firestopping work is specified in Section 078400.
  2. Mineral wool for acoustic interior partition insulation is specified in Section 092000.
10. Installation of Sealants
1. Do sealant work to the requirements of Section 079000. Properly compressed and installed backer rods are required at all joints receiving sealants.
11. Inspection and Clean Up
1. Promptly after application, as the work proceeds and on completion, inspect the installed work and remediate defects and deficiencies.
  2. Clean up thoroughly and remove all equipment offsite.
  3. Clean to the Consultant's approval: soiled surfaces, spatters, and damage caused by the work of this Section. Use means of removal that do not mar or injure finished surfaces.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here. Comply with Ontario Building Code Part 5 requirements for vapour diffusion and air transmission, and the more stringent requirements of this Contract.
2. The work of weather barrier installation shall achieve the performance criteria for air transmission as identified in the Ontario Building Code and further as specified herein, as less than  $0.02 \text{ L}/(\text{s} \cdot \text{m}^2)$  when under differential pressure across the assembly of 75 Pa when tested in situ.
3. The work of weather barrier installation shall achieve the performance criteria for vapour diffusion and transmission as identified in the Ontario Building Code and further as specified herein, whereby all connections between and among materials and products shall achieve at minimum the vapour control of the specified materials being connected, when tested in situ.
4. The weather barrier system shall be installed to provide continuous sheet membrane across all portions of the enclosure assemblies that are subject to movement under differing live load conditions that will be encountered in the life of the Project. Foam insulation and sealants shall not be used except to provide secondary weather barrier and thermal barrier protection. All continuity of weather barrier across movement areas shall be by sheet membrane flashing with suitable detailing to ensure the membrane is not stressed at any point in the movement cycle.
5. Penetrations of the Weather Barrier Systems for structural support of components shall be effectively sealed to achieve the surrounding performance in the system, without exception.
6. Perform all work to meet requirements of Section 070500 Environmental Separation System.
7. All weather barrier system work shall be co-ordinated with re-roofing and alteration work to existing roofs, and at existing upstand walls at roofs. Include all costs for removals, lapping, and installation of new materials and Products to detail and to provide continuity of each system to existing portions of the system.

### 2. Related Requirements

1. The Contractor shall thoroughly review all Sections of the specifications and all drawings to ensure that the requirements for execution of complete and functioning Weather Barrier Systems throughout the Work. Perform all work to meet requirements of Section 070500 Environmental Separation System.

Concrete shall not be considered as a functioning air barrier or vapour retarder.

Operable windows and doors shall be acceptable breaches in the weather barrier system only when in the open position. Otherwise, seals and weatherstripping gaps to operable components shall form tight seals.

Air intakes and exhausts are acceptable breaches of the system, only to the interior of ducts or vents. All conduit where open-ended into the interior environment shall be effectively sealed, whether empty or containing wiring.

Roof and wall membranes intended to provide waterproofing functions shall not be automatically deemed to form part of the Weather Barrier Systems. The Contractor shall thoroughly trace and provide continuity for the systems independently through all environmental separation assemblies in the Documents and specifications.

The Vapour Retarder Barrier System (VR) shall be accomplished as separate barrier layers without reference to waterproofing assemblies except where such assemblies are to be installed on the warm side of the Thermal Barrier.

2. Note that supply and installation of some materials forming part of the Weather Barrier Systems is further described in other Sections, including but not limited to:
  1. Concrete Structure, where sealed with further coating or membrane, and indicated as forming a Weather Barrier;
  2. Steel surfaces in locations where specifically indicated;
  3. Thermal Barrier Materials or Products forming AB or VR (rigid insulation, with joints fully buttered, and spray-insulation where overlapping membrane flashings at perimeter of installation);
  4. Roofing Assemblies, where Weather Barrier and Waterproofing Systems are specified together;
  5. Joint Sealers in rare locations where they form primary Weather Barriers (note that generally joint protection and sealant forms secondary barriers only);
  6. Doors, Frames, and Windows with integral Weather Barrier performance;
  7. Perimeters and Frames of Exterior Grilles, Louvres, and Mechanical Equipment and other accepted breaches in the Environmental Separation Systems; and
  8. Penetrations of assemblies by Mechanical and Electrical Work where air is intended to pass through the pipe or conduit. (In general, all conduits shall be fully sealed after installation of wiring).
  9. Mass masonry wall systems.
3. Inspection work and co-ordination work required to achieve the requirements of this Section are the overall responsibility of the Contractor and shall not be assigned to a trade contractor even if portions of the material installation work are so assigned.
3. Project Meetings
  1. Pre-Installation Conference and Mock-ups:
    1. Schedule during project start-up a meeting with the Consultant to review and consider the means and methods proposed by the Contractor for installation of the systems.
    2. The sequence of installation shall be designed for best longterm system performance. This includes where connections are made to existing portions of systems, whether by base bid Contract requirement or accepted Provisional Pricing requirements.
    3. The pre-installation conference shall review and inspect, and potentially test, mockups of select portions of connection assemblies, to confirm procedures, detailing, and installer responsibilities.
4. Submittals
  1. Submit as described in Division 1:
    1. Prior to ordering materials submit confirmation in writing indicating compatibility of elements forming laps in the Weather Barrier Systems. Include manufacturer's documentation verifying suitability of application for expected application conditions.
    2. Submit product description and catalogue details for all products in the systems.
    3. Prepare onsite mockups of installation conditions and the sequence of installation to demonstrate achievement of the system performance objectives to the satisfaction of the Consultant. Perform this work as an integral part of the work of window and wall cladding trades, under the direct supervision of the Site Superintendent.
    4. Trade contractors performing work described by this Section shall participate and cooperate fully in the work described by Section 070500 for testing, commissioning, and planning the sequence of installation for the components of the Weather Barrier Systems.

5. Co-ordination
  1. Review submittals of this and other work to ensure full understanding of interrelation of components that will achieve the performance of the Weather Barrier Systems.
  2. Note that at times throughout the assemblies the two systems (air barrier and vapour retarder) may be accomplished by the same component, but that installation of each system shall be independently considered.
  3. The Thermal Barrier and Weather Barrier Systems to above-grade walls are accomplished in large part by the insulations described in Section 072000.
  4. Sequencing:
    1. Sequence work to permit installation of materials in conjunction with related materials and seals. Trades shall strictly conform to sequencing requirements for Weather Barrier Systems. Such requirements shall have primary precedence over all other sequences.
    2. Sequence the Work and provide connections across and between the Parts of the Work when they are performed as separate portions of the work schedule, or pre-fabricated, so that the Weather Barrier Systems is complete and continuous in the finished Work.
    3. Sequence the Work so that membranes and other flexible elements of the systems have positive support to the Building Structural System through the use of sheet steel and bent steel, as detailed and as necessary to provide backing support for membranes.
    4. Sequence the Work so that membranes are compressed and secured between continuous components of adjacent elements in the Environmental Separation System. Reliance upon sealant or foam-in-place insulation for connections is not acceptable.
    5. Schedule and sequence the Work so that membranes and connections between existing materials forming the AB or vapour retarder in the existing building are connected for continuity, in conjunction with other alteration work and Owner's requirements for scheduling aspects of the Work. The Work and the Contract Amount includes all multiple mobilizations and performance required to suit scheduling.
6. Reference Standards and Codes
  1. Ontario Building Code requirements for continuous and complete air barrier and vapour retarder shall be achieved except where noted otherwise. Owner may test to reference standards using independent testing firm to evaluate performance, as set out in Section 070500.
7. Safety Requirements
  1. Provide fire protection measures during installations to exceed Division 1 requirements.
8. Basic Product Requirements
  1. Storage and Handling:
    1. Handle and store membrane materials to prevent tearing, puncturing and other damage.
    2. Store roll goods in upright position and protected from the weather.
9. Basic Execution Requirements
  1. Installer Qualifications:
    1. Installers shall be shall be fully trained, and fully equipped to install components of the barrier systems and connections to adjacent elements of the barrier systems and shall be accepted by the Superintendent after completion of training and by Consultant to perform such work. Submit evidence of experience and qualifications upon request.

2. Job Conditions:

1. Apply membrane portions of the systems during dry weather and to dry substrates only.
2. Apply materials only within acceptable application temperature range determined by manufacturer. Select a membrane system that is best suited for the expected application conditions. Use the same system throughout entire project. Where primers or work involve water-based components and curing, perform such work only in conditions that fall within manufacturer's recommendations for environmental conditions.

10. Warranties

1. The Contractor, and all trade contractors performing work under this Section, warrant all work to the Environmental Separation System and Weather Barrier Subsystems in accordance with Division 1 requirements and the general conditions of the Contract GC12.3.1 and 12.3.4, for 2 years following Substantial Performance of the Work.
2. Include coverage of installed components and sheet materials which fail to achieve air tight and watertight seal, exhibit loss of adhesion or cohesion, or do not cure, in accordance with the General Conditions GC12.3.4, but for three years from Substantial Performance of the Work.

11. Identification of Building Systems

1. The work described by this Section forms components in the following Building Systems as defined in Section 019010. Comply with requirements for the integration of the work described in this Section into its roles in the various systems. Provide the work so that the performance requirements of the overall system of which it forms part is achieved. Trade contractors shall not proceed in uncertainty regarding the role or requirement of the component in relation to the system. Obtain clarification from the Contractor and the Trade Contractor responsible for the system, as set out in Section 019010:
  1. Environmental Separation System, to provide components of that system, as described in Section 070500.
  2. Thermal Barrier Systems: as companion layers in close contact with this System.

## 2. PRODUCTS

1. Materials

1. General: Provide all necessary materials and products as required to achieve specified performance criteria; functionally compatible with adjacent materials and components.
2. Air Barriers and Vapour Retarders:
  1. Joints to Weather Barrier Systems in wall enclosures, and that are located on warm sides of thermal barrier system, shall be accomplished with self-adhering Baker Henry Blueskin SA grade membrane supplied in appropriate width rolls for connection work, or SopraSeal Stick FlashPro HT by Soprema.
  2. Joints to Weather Barrier Systems in wall enclosures, and that are located on cold side of thermal barrier system, or to connect to masonry mass walls, shall be accomplished with self-adhered, vapour permeable, water-resistive, commercial air barrier Baker Henry Blueskin VP 160 or equivalent by Soprema.
  3. The membrane material shall be supplied with protective film to each half of the width of the roll such that one portion may be installed while leaving the adjacent half protected until the connection is completed by following work.

4. Connection to adjacent components shall then be by the installer of the adjacent component, including careful sealing and installation of window and door systems and wall-tie connectors, except at gaps in doors and louvers where systems are deliberately not complete within the interior of the opening. Equivalent products by Grace, Soprema, and WR Meadows are acceptable.
3. Sheet Membrane Primer: Bakor Henry 910-02 or as recommended by manufacturer.
4. Air Barrier Sealants:
  1. Bakor Henry Polybitume or as recommended by manufacturer, in accordance with Section 079000.
  2. For single staged exposed seals or movement joints in masonry mass walls, Polyurethane Dymonic 100 or silicone Spectrum 1.
5. Adhesives, mastics, joint backing: as recommended by membrane manufacturer for condition.
6. Metal backing is required to bridge gaps greater than 25 mm: cold rolled sheet steel, hot dip galvanized to ASTM A525, zinc coating designation Z275; unless otherwise shown, 0.9 mm thick, formed for intended location with min. 75 lap to each adjacent component.
7. Where indicated in documents portions of the V.R./A.B system may be formed with the window assemblies, with connection to membrane flashings to the requirements of this Section.
8. Where indicated in documents portions of the V.R./A.B. system may be formed by complete and continuous buttering of joints in rigid insulation installations as set out in Section 072000 and to the performance requirements of this Section.
9. Where indicated in the documents, air and vapour barrier installed to below slabs-on-grade shall be 15 mil Perminator, by WR Meadows or equivalent, c/w vapour barrier Perminator Tape or accepted equivalent.
10. Vapour retarder in roof system is described in Sections for such systems. Air barrier is normally formed by the roofing membrane in these locations. Ensure connection of both elements from the roofing system to the wall systems where AB and VR are generally formed by one element.
11. Minor repairs to exterior wall areas where a vapour permeable air/water barrier/transition is required, to allow moisture within mass walls to escape/dry to the exterior, use Blueskin VP or SRP Airoutshield.

### 3. EXECUTION

#### 1. General

1. Execute work as described herein and to achieve the performance set out in the General Requirements of this Section and Section 070500. In all cases leave sufficient material during the sequence of installation of membrane work to allow for completion of the connections and laps to the work to follow. Leave plastic protective stripping on portions of the membranes that are left by one trade for completion of connection by a following trade.
2. Co-ordinate work described elsewhere in the Contract to ensure complete and continuous systems to achieve Ontario Building Code objectives for air leakage resistance and to further requirements of this Section and Section 070500, and resistance to vapour transmission, for all new assemblies.

3. Other portions of the wall assembly must be installed PRIOR to installation of window frames and associated support clips and connections, in order to properly sequence the Weather Barrier Systems installation between windows or curtainwall and adjacent construction. Perform the Work in required sequences as established at pre-installation conferences and by accepted shop drawing submission.
  4. The Superintendent shall ensure that portions of membranes to each portion of the Weather Barrier System that are installed with proper excess for lapping to subsequent components are not then trimmed and cut off by the Contractor's or other trades forces. Protect partially completed work and ensure protective films are not removed from the excess until just before completion of the connections. Where work intended for laps has been trimmed, the Contractor shall replace the work at its own expense.
2. Examination
    1. Examine substrates to ensure conditions are satisfactory to receive membrane work of this Section. The superintendent shall sample conditions to determine that work is in accordance with requirements.
    2. Start of work shall imply acceptance of conditions.
    3. Substrates shall be sound, reasonably smooth, dry, clean, free of frost, grease, oil and other substances that would adversely affect membrane adhesion.
    4. Inspect the Weather Barrier System work installed by other trade contractors, such as the roofing trade and waterproofing trade, to ensure that sufficient lap is present and surfaces are able to receive continued Weather Barrier work.
    5. Ensure that sheet metal backings and closures are installed to allow for installation of connection membrane work, and are accepted by Consultant.
  3. Preparation for Membrane Applications
    1. Clean substrates as required.
    2. Remove sharp projections and repair defective areas in substrate.
    3. Install primer to first surface to receive membrane, where manufacturer recommends the use of same for the substrate involved. Allow primer to cure completely.
  4. Membrane Installation
    1. Install membrane connections in accordance with manufacturer's installation instruction, to all locations where air barrier and / or vapour retarder is not specifically identified in documents, without additional cost to the Owner.
    2. Apply membrane in least number of pieces possible, and from exterior side of envelope assembly. Work from base of wall upward so that joints overlap to shed moisture to the exterior of the assembly.
    3. Pre-cut sheets and work with appropriate widths of supplied rolls to suit width of connection, including allowance for excess.
    4. Position membrane for alignment and apply pressure to the membrane by appropriate roller, at the point where the membrane is in contact with the substrate. Apply sufficient pressure to achieve a continuous seal without wrinkle or fishmouth.
    5. Cut membrane at ties, and use trowel to form a tight seal around projection.

6. Detail work must be carefully carried out to ensure continuous air tightness of the membrane . Reinforce corners with a piece of membrane and use trowelled on sealant material to ensure joints are tight at all penetrations.
  7. Membrane shall be provided to joints to perimeter of all window and door frames, and to components of the assemblies where such components intersect with other materials forming the AB / VR system.
  8. Install the membranes complete with reverse folds and laps to ensure adhesive contact with the appropriate adjacent surface, in accordance with accepted submittals and mockup of sequence.
  9. Contractor's Superintendent shall co-ordinate the trades and ensure their forces are properly trained to complete the work in accordance with the accepted mockup and sequence.
5. Installation of Urethane Foams and Sealants
    1. Urethane foams and sealants are not acceptable as primary Weather Barrier Systems in the completed Work. They are fillers and sealers that protect the membrane Weather Barrier connections, and complete the Thermal Barrier System across and near the membrane installation and to adjacent components. The expansion of the foam assists in compressing the membrane so that it can complete and maintain its permanent seal to adjacent substrates.
    2. Install foam-in-place insulation and sealants to form secondary Weather Barrier layers in the Weather Barrier System, and as set out in Section 072000 and 079000 respectively.
    3. Sealants must be installed by a separate sealant trade contractor using forces skilled and experienced in such work. Properly compressed and installed backer rods are required at all joints receiving sealants.
  6. Installation of Membrane to Slab-in-grade Areas – N / A this Project
    1. Ensure base course and insulation are smooth, level and without gaps, and all underslab work of other systems is complete and accepted by Consultant and Authorities.
    2. Install sheet membrane vapour retarder flat and in accordance with manufacturer's instructions, without wrinkle or fish-mouths, lapped min. 150 mm between sheets. Cut to shape and for laps up the perimeter. Tape all lapped joints and tape completed sheet membrane to exterior foundation wall so that it forms bond breaker between wall and floor pour.
    3. At areas to be left open for secondary floor pours, ensure min 300 of excess material is lapped up the formwork on the first pour side, so that after form removal the vapour retarder can be folded back down to form lap for further installation and pour.
  7. Cleaning
    1. Allow material to cure completely before attempting cleaning or removal of droppings. Do not handle and smear while foam or membrane is setting.
    2. Clean adjacent finishes with methods specifically recommended by supplier of material to be cleaned, so that finishes are not affected.
  8. Protection of Work
    1. Protect work of systems as it progresses, and make good portions of installations that are damaged by other work.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division One, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.
2. Contractor must be a member in good standing with the Ontario Industrial Roofing Contractors Association (OIRCA).
4. The Trade Contractor undertaking the work of this Section shall also perform the work of Section 076200, Sheet Metal Flashings and Trim.
5. Flood-testing of flat roofs for watertightness shall be performed after initial installation of membrane, and shall be re-performed prior to Substantial Performance of the Work to a timing at the sole discretion of the Consultant. The purpose of the re-test is to ensure that the installed membrane systems have not been damaged or otherwise compromised by other portions of the construction operations.
6. Perform ALL work to meet requirements of Section 070500.

### 2. Related Requirements

- |  |                    |
|--|--------------------|
| 1. Selective Demolition of Existing Roofs and Parapets | Section 024119     |
| 2. Existing Brick Masonry                              | Division 04        |
| 3. Metal Safety Rail Systems                           | Section 055200     |
| 4. Miscellaneous Metals                                | Section 055000     |
| 5. Rough Carpentry                                     | Section 061000     |
| 6. Environmental Separation System                     | Section 070500     |
| 7. Thermal Barrier System                              | Section 072000     |
| 8. Weather Barrier Systems                             | Section 072500     |
| 9. Sheet Metal Flashing and Trim                       | Section 076200     |
| 10. Roofing Accessories                                | Section 077200     |
| 11. Joint Protection                                   | Section 079000     |
| 12. Mechanical   | Divisions 20 to 23 |
| 13. Electrical   | Division 25 to 28  |

### 3. Scheduling and Sequencing of the Roofing Work

1. Each roof operation shall be sequenced and scheduled to suit the overall Construction Schedule, the Owner's requirements for occupancy of portions of the facility, and safety.
2. In particular, re-roofing operations to areas of the existing building shall be undertaken to an agreed schedule with the Owner, taking into account occupancy areas below the roof and occupant disruption and safety. This Contract includes multiple mobilizations for roofing operations such that each roof area and level may be independently scheduled, without further cost to the Owner.
3. Roofing operations shall be scheduled in advance, with adequate allowance in the schedule for effects of weather. Re-roofing of existing areas, including removal of existing roofing assemblies in the Environmental Separation System shall be scheduled with adequate lead time and adequate allowance for delay of start to suit developing weather conditions.
4. Schedule re-roofing operations of existing areas in late spring or summer months such that roofing operations are not hampered by potential snowfall and likelihood of storms is reduced.

5. Re-roofing operations located above existing portions of the building that are continuously occupied during the course of the Contract Time shall be scheduled and roofing operations designed to the acceptance of the Owner. The Contractor shall provide specific proposals for such roofing operations including location of required staging areas and temporary effect upon building occupancy and life safety of occupants, all in accordance with Reference Documentation, Owner's Operation, Safety and Security Conditions. Access to existing roofs shall under no circumstances be through occupied portions of the existing building. Arrange all access from exterior only, and pay all costs for such temporary access.
4. Pre-Installation Meetings
  1. Conduct a separate Pre-Installation Meeting for each roof operation. Meet 2 (two) weeks prior to commencement of roof installation, or stripping of existing roofs, review and document methods and procedures related to roof deck and roofing system construction, including the following:
    1. Participants: authorized representatives of the Contractor, Owner, Consultant, roofing Subcontractor, and manufacturer of roofing system.
    2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
    3. Review construction schedule and confirm availability of Products, Subcontractor personnel, equipment and facilities.
    4. Review substrate installation criteria and finishes for conformance with roofing system criteria, including issues of flatness and fastening.
    5. Review structural loading conditions and limitations of roof deck both during and after roofing application.
    6. Review flashing details, special roofing details, roof drainage, roof penetrations, equipment curbs, and other conditions affecting roofing installation.
    7. Review governing regulatory requirements, and requirements for insurance and certificates as applicable.
    8. Review safety requirements, including fall-arrest measures & hot work protection.
    9. Review field quality control measures.
5. Submittals
  1. Submit in accordance with Division 1:
    1. Qualifications: Submit evidence of OIRCA membership in good standing.
    2. 2 weeks prior to the Pre-Installation Meetings, submit a complete description of the Roofing Work and its installation, including all detailing in the form of written instructions and drawings for every condition to be encountered in the work, prepared specifically for this Contract and bearing the signature of the roofing manufacturer's representative and the individual responsible for the roofing system as identified in accordance with Section 019010.
    3. Product Data: for each major component, including membrane plies, adhesives, thermal barrier underlay board where applicable, vapour retarder, rigid board insulations, adhesives, pavers, and accessories. Highlight critical criteria for proper installation.

4. Compatibility statement from Roofing Trade Contractor, as set out in this Section.
5. Submit roofing inspection reports from system manufacturer's representative, as set out elsewhere in this Section.
6. Samples for Acceptance: Provide sample of all products, materials and accessories.
7. Mock-up:
  1. Construct a minimum 10 sq. m mock-up of roof system in location acceptable to Consultant showing typical lap joint, gusset, [inside corner, outside corner, curb, and drain prior to installation of roofing system.
  2. Arrange for Consultant's review during construction of the mock-up a minimum of 48 hours in advance.
  3. Mock-up may remain as part of the finished Work if accepted by Consultant.
  4. Do not commence roof installation until Consultant has reviewed mock-up.
  5. Upon acceptance, mock-up shall serve as a minimum standard of quality for the balance of the Work of this Section.
8. Submit wind uplift resistance test report for proposed roof assembly and fastening rate. Test report to be completed by an independent third party testing agency to CAN/CSA A-123.21.
  1. Factored Wind Loads for Roof Securement:
    1. At Corners 44 psf
    2. Edge 20 psf
    3. Field 15 psf
  2. Conduct fastener pull-out tests in structural wood deck, where no CSA 123.21 compliant test data is available.
9. Submit Shop Drawings of layout and heights for sloped /tapered insulation indicating roof perimeters, penetrations, curbs, slopes, ridges, valleys, low points in existing roof deck that may form areas of ponding, crickets, sumps, and roof drain locations. Identify conflicts between insulation heights and existing installed features.
6. Reference Standards and Codes
  1. CAN/CGSB-37.56-M 9th Draft, Membrane, Modified, Bituminous, Prefabricated and Reinforced for Roofing
  2. ASTM D4601-86 Specification for Asphalt Coated Glass Fibre Base Sheet Used in Roofing.
  3. ASTM C726 Mineral Fibre Roof Insulation Boards
  4. CSA B35.3-1962 Tapping and Drive Screws (Slotted and Recessed Head, Thread)
  5. CAN/CGSB-37.5-M89 Cutback Asphalt Plastic Cement
  6. CGSB 37-GP-9Ma-83 Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing
  7. CGSB 37-GP-15M-76 Application of Asphalt Primer for Asphalt Roofing, Dampproofing and Waterproofing
  8. CGSB 37-GP-21M-76 Tar, Cutback, Fibrated for Roof Coating
  9. CAN/CGSB-37.29-M89 Rubber-Asphalt Sealing Compound
  10. CAN/CGSB-51.33-M89 Vapour Barrier Sheet, Excluding Polyethylene, for Use in Building Construction

11. Do roofing work in accordance with applicable standard in Canadian Roofing Contractors (CRCA) Roofing Specifications Manual, except where specified otherwise, and written recommendations of system manufacturer. The most stringent requirements apply in all cases.
7. Quality Control
  1. Submit Manufacturer's Field Inspection Reports indicating manufacturer's written acceptance of roofing installation based on daily inspections during installation.
8. Performance Requirements
  1. Roofing System: two-ply application, cold applied modified asphalt bituminous reinforced base and cap sheet membranes, rigid board insulations mineral and isocyanurate, fibreboard slopes, underlay board, kraft paper vapour retarder.
  2. Provide Products that are compatible with one another in field conditions, as demonstrated by roofing manufacturer. All components shall be fully adhered, not mechanically fastened.
  3. Provide watertight roofing system capable of resisting specified uplift pressures to CSA A123.21, thermally induced movement and exposure to weather without failing during the specified warranty period.
9. Fire Protection
  1. Provide fire protection measures with Division 1 requirements whenever other work, or work of this Section, involves hot work near or on roofing surfaces.
10. Basic Product Requirements
  1. Compatibility between components of system and adjacent materials and products of other construction is essential. The individual responsible for the roofing system as identified in accordance with Section 019010 shall provide written declaration to Consultant stating that materials and components, as assembled in system and for connections to adjacent system, and to all locations in the Work, meet this requirement.
  2. Identification Delivery
    1. Indicate on containers or wrappings and materials:
      1. Manufacturer's name and brand.
      2. Compliance with applicable standard.
      3. Mass where applicable.
    2. Deliver materials in original containers, sealed, with labels intact. Ensure that shelf life of materials has not expired.
    3. Supply three copies of purchase orders to Consultant. Include the following data:
      1. Purchase order number.
      2. Supplier's name and address.
      3. Purchaser's name and address.
      4. Contract number and job number.
      5. Material and governing specification including type, grade, colour, class and quantity.
      6. Shipping instructions.
      7. Destination.
    4. Remove damaged and/or rejected materials from site.

3. Storage and Handling

1. Provide and maintain dry, off-ground weatherproof storage.
2. Store materials on supports to prevent deformation.
3. Store all rolled material in upright position.
4. Remove only in quantities required for same day use.
5. Store materials in accordance with manufacturer's written instructions.
6. Store insulation protected from daylight and weather and deleterious materials. Store insulation such that it will not blow away in even severe weather or wind events.
7. Store adhesives and caulking at +5°C minimum.

11. Basic Execution Requirements

1. Environmental Requirements

1. Stop work when temperature remains consistently below -5°C, especially when wind chill effect would tend to set adhesives or bitumen before proper adhesion takes place.
2. Install membranes on dry substrate, free of snow and ice, use only dry materials and apply only during weather that will not introduce moisture into system.
3. Ensure that temperature of substrate and its moisture content conforms to manufacturer's minimum requirements, before proceeding with work.

2. Installer Qualifications

1. Installer workforce Certificates: Signed by installer verifying that workforce members have the specified qualifications described below.
2. Installer: a company accepted by the Owner and manufacturer, employing qualified personnel who will not walk on the plies until the roof membrane system has set, except when performing corner flashing and edge detailing as specifically prescribed by the manufacturer.

3. Cleaning

1. Remove spills, sprays, or other droppings from metal flashings and surrounding surfaces. Promptly, as the work proceeds, and on completion, clean up and remove from the premises all rubbish and surplus material resulting from this work.

12. Warranty

1. Contractor Warranty

1. OIRCA Warranty: Remedy all material and workmanship defects in the modified bituminous membrane roofing system, including but not limited to roof assembly, membrane flashings, metal flashings, and sealants, that appear within 2 (two) years from date of Substantial Performance of the Work.

2. To be standard form of warranty issued on letterhead from Ontario Industrial Roofing Contractors Association (OIRCA).
  2. Manufacturer shall warrant in accordance with GC 12.3.1 and 12.3.4 as further amended by this Section, to promptly correct any defects in the roofing system at no expense to the Owner including, but not limited to, the mod-bit roofing remaining in place and leak-proof for a period of 20 (twenty) years following Substantial Performance of the Work. Warranty shall not be pro-rated.
  2. The Roofing Manufacturer shall incorporate regular inspections, housekeeping and preventative maintenance service for the Work of this Contract into the warranty provisions and these requirements shall survive the Completion of the Contract, as follows:
    1. Visual inspection of all roof membrane and flashings.
    2. Preventative maintenance including repair of minor tears, splits and breaks in roof membrane and flashings, topping of pitch pockets, resealing of voids in caulking around metal details and reglets, tightening and resealing of exposed fasteners and resealing of termination bars and metal counterflashing.
    3. Record noted deficiencies and arrange for their proper repair under warranty.
    4. Housekeeping shall include the cleaning of drains, gutters and scuppers and removal of incidental debris.
    5. Inspections shall be carried out in years 2, 5 and 10 of the warranty.
    6. All components of the system including vapour retarder, insulation courses, membrane and perimeter metal shall be included in the warranty.
  3. Warranties shall be fully transferable by the Owner.
13. Identification of Building Systems
1. The work described by this Section is related to the following Building Systems as defined in Section 019010. Comply with requirements for performance, review and coordination of such systems:
    1. Roofing Enclosure System, forming part of the Environmental Separation System.
    2. Building Structural System, for differential movement in conditions of service among components of each portion of the structural system and to adjacent buildings.
    3. Emergency Egress and Exiting System, for contrasting cap sheet egress and maintenance pathways.

## 2. PRODUCTS

1. Manufacturers
  1. Tremco Canada or equivalent by Siplast, Soprema.
2. Materials
  1. Thermal Barrier Underlay Board to areas on steel deck: 1/2" (13mm) thick glass mat faced gypsum panel with water-resistant core, and meeting the following criteria:
    1. Combustibility: Noncombustible to ASTM E136.
    2. Surface Burning Characteristics: to ASTM E84, max. FSR of 0, SDC of 0.
    3. Manufacturer: Dens-Deck by G-P Gypsum. Provide to all areas of steel deck.

2. Vapour Retarder shall be kraft paper, with peel and stick membrane flash at curb assemblies and perimeter interface with adjacent vapour retarders from adjacent wall systems. Equivalent membrane flashings shall be purpose-made high performance 40 mil to satisfaction of Consultant. Base vapour retarder shall be Kraft.
3. Base sheet: Standard or accepted equivalent, min. 3 mm, glass-reinforced, adhered with cold adhesive for application to manufacturer's requirements for coverage.
4. Cap sheet: Standard FR granule-finished sheet, lightest white colour to Consultant's selection from standard colour range, min. 3.5 mm thickness, composite fibreglass-polyester, adhered with cold adhesive for application to manufacturer's requirements for coverage.
5. Flashing membranes: reinforced with finish to match base and cap, to match cap sheet wherever exposed in the finished Work. All field, projection and perimeter flashings are to be heat sealed and capable of forming profiles and corners as indicated in details.
6. Adhesives and Sealing Compounds: to strict written recommendations of system manufacturer, lowest VOC option, polymer modified.
7. Roof Insulation in cross-lapped layers: poly-isocyanurate rigid board; to ASTM C 1013-85, Class 1, closed cell type, Trisotec, Soprema Sopraiso, Paratherm by Siplast, or accepted equal by NRG or Atlas:
  1. Long Term Thermal Resistance: CAN/ULC-S770, min. RSI 1.01 per inch thickness.
  2. Compressive Strength: (ASTM D1621): 140 kPa.
  3. Dimensional Stability (ASTM D2126): < 2 per cent linear change.
  4. Water Absorption (ASTM C209): < 1 percent by volume.
  5. Edges: square
  6. Faces: non-asphaltic, fibre-reinforced felt facers both sides.
  7. Combustibility: meets CAN/ULC-S107-M87 and CAN/ULC-S126-M86.
  8. Thickness: 75 mm
  9. Base course of insulation shall be mechanically fastened. (Fully adhered methods are not applicable this Project).
8. Overlay Board: 1/2" (13 mm) thick high-density polyisocyanurate cover board, to CAN/ULC-S706, Type I, Grade 1.
9. Tapered insulation and sumps: Posi-slope or equivalent, polyisocyanurate, minimum thickness at tapered edges 1/2" (13mm).
10. Vapour retarder seam sealer: As recommended by Manufacturer.
11. Cant strips: cut from 1 1/2" (38mm) thick fibreboard material, 45° slope.
12. Roof Accessories: All as per Section 077200.
13. Sealing compound: to CAN/CGSB-19.24-M80.
14. Polyethylene back-up rope: extruded closed cell foam, Shore A hardness 20, tensile strength 140 to 200 kPa, compatible with primers and sealants, oversized 30% to 50%.

### 3. EXECUTION

1. Work to Existing Roofs
  1. Provide all work required to remove all existing PTO and Mod-bit roofing systems, down to expose the existing structural deck.

3. Provide all work to marry new up-stands and new roof penetrations to existing roofs.
  4. Remove and dispose of existing portions of roof sequentially, where immediate re-roofing is required, so that no portion of roof is exposed for more than a day's re-roofing work, to minimize potential for damage to existing building.
  5. Take all precautions and protective measures to ensure that removals and selective demolition do not result in migration of materials into the building interior, attic spaces, or ceiling spaces.
  6. Protect mechanical intakes and arrange for shutdowns so that work to existing roofs during selective demolition and re-roofing does not migrate into the building either as odour or with particulates.
  7. Work to existing roofs includes co-ordination and performance of all removals and replacements of adjacent parapet, flashings, parapet cap flashings and work at existing roof curbs and penetrations. The Roofing Trade Contractor shall co-ordinate the appropriate trades who shall perform temporary relocations, alterations of other components of building systems, and re-installations.
  8. Where re-roofing requires lifting of existing rooftop mechanical units, or removal of components of other systems to facilitate the roofing, the Roofing Trade shall arrange and pay for such operations to the appropriate Trade Contractor for such system, so that removals and new detailing and flashings can be accomplished to achieve a complete and leak-proof roofing installation.
  9. The warranty provisions for all areas of re-roofing to existing building roof areas are the same as for new roofing to new areas of building addition, without exception. Perform the Work to achieve such performance and manufacturer's warranty.
2. Workmanship
    1. Do roofing work in accordance with applicable, standard in Canadian Roofing Contractors Association (CRCA) Roofing Specifications Manual, except where specified otherwise.
  3. Plant and Equipment
    1. Use cold-applied methods of installation, at installers discretion.
  4. Protection
    1. Cover walls and adjacent work where materials hoisted or used. Provide additional protection where hoisting against historic masonry walls.
    2. Use warning signs and barriers. Maintain in good order until completion of work.
    3. Clean off drips and smears of material immediately.
    4. Dispose of rainwater off substrates and away from face of building to accepted drainage patterns until roof drains or hoppers installed and connected.
    5. Protect from traffic and damage. Comply with precautions deemed necessary by Consultant. Repair damage caused by non-compliance with Consultant's requirements, or failure to protect.
    6. Place plywood runways over work to enable movement of material and other traffic.

7. At end of each day's work or when stoppage occurs due to inclement weather, provide protection for completed work and materials out of storage.
8. Install insulation promptly to avoid possibility of condensation beneath vapour retarder.
5. Examination of Roof Decks
  1. Examine roof decks and existing areas of roofing that are for replacement immediately inform of Consultant in writing of defects.
  2. Prior to commencement of work ensure:
    1. Decks are firm, straight, smooth, dry, free of snow, ice or frost, and swept clean of dust and debris.
    2. Curbs have been built, cones are installed, roof drains are ready for installation, perimeter sheet metal up-stands are installed. Ensure that rough-ins for roof anchors, railings, and other elements penetrating the roof are installed and accepted by the Consultant.
    3. Roof deck and existing roof construction shall be structurally sound to provide support for new roof system. Notify Consultant of any rusted or deteriorated decking to determine method of treatment of replacement.
    4. All materials and Products required for re-roofing operations, including temporary protection systems for covering of exposed areas of building during re-roofing, are present at site and available for the work. This includes all components and labour forces necessary for accomplishment of alterations or removals and re-installations of adjacent portions of the Environmental Separation System.
6. Preparation of Deck
  1. Remove protruding fasteners and inspect deck as required to provide level surface.
7. Vapour Retarder
  1. Prime protection board and fully adhere vapour retarder to achieve required roofing bond in the finished assembly. Provide 100mm (4") side laps and 150mm (6") end laps sealed using seam sealer.
  2. Extend vapour retarder under cant strips and up faces of equipment curbs and blocking by using sheet membrane vapour retarder specified. Kraft paper in these locations is not acceptable. Extend to perimeter and deck protrusions, and connection to previously installed sheet membrane laps in parapet assemblies and upstands.
  3. Leave sufficient material to lap to heights required by details and to connect with wall system vapour retarder elements, and seal retarder to adjacent vapour retarders where they have been previously installed.
8. Insulation First Course: Mechanically Fastened
  1. Mechanically fasten first layer of insulation to roof substrate with screws and plates using minimum one fastener per 0.27m<sup>2</sup> and as required for perimeter to suit uplift standard. Unless insulation is installed in cold weather, butt joints tight and adhere to achieve required roofing bond in the finished assembly.
9. Insulation Upper Courses: Low-rise Adhesive Foam or Rubberized Asphalt

1. Adhere upper courses of insulation as required to meet uplift and fastening criteria and to form surface for membrane installation. Ensure continuous and adequate coverage to safely transmit all uplift forces to deck without loss of adherence. Stagger all joints 12" (300 mm) minimum in successive layers, and butt joints tight unless poly-iso is installed in cold weather.
  2. Do not jam or deform boards. Reject boards damaged in delivery or handling. Walk insulation boards into adhesive to achieve solid contact immediately after placement.
  3. At end of each work period, adhere membrane over exposed surfaces and edges of insulation and onto vapour barrier to render watertight. Remove this seal on resumption of work.
  4. Install crickets to all curbs and penetrations, and where indicated on drawings, to maintain good patterns of roof drainage, and to ensure drainage of rainwater away from openings and penetrations.
  5. Sump insulation at roof drains using purpose made sloped polyisocyanurate sumps, designed for integral use with sloped / tapered insulation.
10. Polyisocyanurate Cants and Slopes
1. Install cants over rigid insulation at perimeter and corners to membranes unless the manufacturer of the system specifically warrants installation without cants as best practice. Install back-to-back cants to form mid-roof water diversion where indicated on drawings or in details.
  2. Apply adhesive to receiving surface and embed cant firmly by hand.
  3. Fasten or adhere sloped cants in pattern designed by slope system manufacturer for smooth finished surface free of ridges and gaps. Adhere using same methods as for rigid insulation.
  4. Angle cut cants to fit tightly on back & bottom where roof to wall angle varies from 90°.
11. Base and Cap Sheets: Membrane Application
1. Install the cold-applied membranes in strict accordance with roofing system manufacturer's written instructions, at rate specified by supplier of material, after manufacturer's representative as inspected and accepted insulation installation and pattern of falls as conforming to the Contract requirements and best practice.
  2. Avoid walking on plies until adhesive and material has set.
  3. Lay sheets parallel to building lines and to one another, for neat and true finished lines. Overlap sheets and allow base sheets to relax prior to performing cap sheet work. Overlap the base sheet 100 mm. Cut corners of sheets at 45 degrees where T joints occur, on system manufacturer's recommendations.
  4. Offset base and cap plies to start and finish roof membrane along roof edges and terminations.
  5. Apply membrane hot adhesive no more than 3 m ahead of each roll being embedded.
  6. Ensure complete and continuous seal and contact between bitumen sheets, including ends, edges, and laps without wrinkles, fishmouths, or blisters. Ensure an even and slight bead of adhesive or bitumen is visible along all sheet lap lines.
  7. Overlap previous day's work 600 mm.

8. During application of each ply, cut out fishmouths/side laps which are not completely sealed. Patch sheet to extend minimum 12 in. beyond cut in all directions. Patch in accordance with roofing manufacturer's instructions. Patch. Replace all sheets which are not fully and continuously bonded.
  9. Lap ply membrane ends 150 mm. Stagger end laps 1 metre minimum.
  10. Using a hot air welder, heat seal all field seams to ensure permanent seal and bond at seams.
12. Membrane Flashings: General
1. Apply membrane flashings at valleys, ridges, eaves, junctions of horizontal and vertical surfaces, roof drains, vents and other roof mounted appurtenances.
  2. Ensure surfaces are smooth, clean, dry.
  3. Clean all metal in contact with bitumens.
  4. Using a hot air welder, heat seal all perimeter and projection flashing seams.
13. Flashings at Roof Edge
1. Cut roof membrane flush with top edge of cant strip.
  2. Extend reinforced membrane flashing over cant and fascia and tack to outside vertical surface of fascias. Form using hot techniques to ensure profiles to detail and extension over parapets where indicated.
  3. Extend reinforced membrane flashing down over cant strip and embed in flashing adhesive.
  4. Ensure complete bond and continuity without wrinkles or voids. Lap sheeting ends 100 mm, and adhere with flashing adhesive.
14. Flashings at Vertical Surfaces
1. Cut roof membrane flush with top edge of cants.
  2. Install membrane flashing over base and cap sheet in accordance with system manufacturer's recommended sequence, cant and up vertical surface.
  3. Carry membrane flashings far enough vertical surfaces to ensure lap with adjacent wall systems or to provide membrane flashing to parapet details.
  4. Ensure complete bond and continuity without wrinkles or voids. Lap flashing ends 150 mm, and adhere with flashing adhesive.
  5. Install cap sheet flashings in continuous sheets of largest practical size. Do not use cuttings or small portions of membranes to create finished flashings.
  6. Co-ordinate installation of membrane flashings at existing parapets and upstand walls with adjacent wall and structural elements and trade contractors, so that removals of such items are by the appropriate trade contractor and not the Roofing Trade Contractor. This Trade Contractor, performing the work of this Section, shall co-ordinate the scheduling of removals work by the adjacent trade to suit the scheduling and sequencing of the roofing work, and shall pay all costs to such trade contractors by agreement with them unless specific agreement has been reached during the bid period with either the Contractor or such trade contractors. No additional costs are accepted

by the Owner for co-ordination and performance of adjacent removals, alterations, and reinstallations of adjacent portions of existing Environmental Separation System components that are required to accomplish the detailing, the warranty of the roofing system, and the Work.

15. Flashing Vent Stacks and Penetrations, Existing Piping

1. Install polyethylene back-up rope between roof deck and vent stack, and caulk joint prior to insulation installation.
2. Embed vent stack flashing flange in 3 mm thickness of sealing compound on top of roofing plies.
3. Embed base ply and flashing membrane thoroughly into adhesive in accordance with system manufacturer's detailing for penetration conditions. Extend plies 100 and 200 mm beyond outer edge of flange.
4. Lap joints 100 mm, remove wrinkles and buckles prior to proceeding with subsequent layers of roofing.
5. Co-ordinate removal of gas piping and alteration to suit new roof heights and changes to falls with the Gas Trade Contractor. New gas piping supports are described in the Mechanical Division of the specification and shall be provided by the Mechanical Trade Contractor.

16. Flashing Curbs for Roof-Mounted Apparatus

1. Do flashings at curbs for roof mounted apparatus same as for vertical surfaces except extended membrane flashing over top of curb.
2. Ensure that top surface of curbs are level and to acceptance of Consultant prior to roofing in the equipment curbs.
3. For flashings at curbs and penetrations to existing roof areas that receive new roofing, co-ordinate detailing and methods for installation of membrane flashing, insulation, and additional prefinished steel counter-flashing with the requirements and work described by Section 076200 and with the Mechanical Trade Contractor. Any temporary lifting and re-installation of mechanical equipment shall be performed by the Mechanical Trade Contractor in accordance with the standards and requirements of the Mechanical Division of the specification, under agreement with the Roofing Trade Contractor. Pay all costs for this work.

17. Flashing Roof Drains

1. Provide flashing membrane reinforcing to all sumped areas and 150 mm beyond. Carry all sheets down into sump to edge of drain fitting.
2. Embed flashing flange into 3 mm thickness of sealing compounds.
3. Embed membrane flashings and sheets into coatings of seal and adhesive in strict accordance with system manufacturer's details for this condition.
4. Lap joints 100 mm, remove wrinkles and buckles for complete seal.
5. All roof drains are to be replaced. Insert drains are not acceptable.

18. Scuppers and Rainwater Leaders

1. Work of this section includes work at scuppers formed and installed to the standards set out in Section 076200 and as detailed, complete with clamping collars. Membranes shall be completely lapped and fully adhered over the shop-formed scupper. Install scuppers prior to membrane installation.
19. Cleaning and Protection
1. Clean to Owner's acceptance, soiled surfaces, spatters, and damage caused by work of this Section.
  2. Check drains to ensure cleanliness and proper function, and remove debris, equipment and excess material from site.
  3. Remove all metal and waste debris from roof surface by thoroughly checking all areas.
  4. Reinspect roofing surfaces upon completion of the subsequent flashing mechanical, and other work. Clean roof of all metal, waste and debris to leave roof in pristine condition.
  5. Protect the installation and prohibit traffic until the roofing finish has cured sufficiently to allow such traffic. Protect the installation with ply sheets where wall envelope installation is occurring to wall areas adjacent and above roof level.
20. Flood Testing
1. Perform 24-hour flood tests to all "flat" roof areas upon completion of roofing operations, and again prior to handover of the completed Work to the Owner.
  2. Establish source of leaks and weaknesses definitively, and repair to meet roof standard and warranty provisions.
21. Warranty Inspections and Maintenance
1. Perform warranty inspections and roof maintenance in accordance with required warranty provisions of this Section and the General Conditions of the Contract as supplemented by the Supplementary Conditions.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.
2. Perform all work to meet requirements of Section 070500 Environmental Separation System.
3. The Trade Contractors undertaking the work of Section 075200 shall perform the work of this section as it pertains to such areas of roofing.
4. Eavestroughs and gutters are described in Section 077200, Roofing Accessories.
5. Scuppers shall be constructed and installed as an integral part of the roofing system, supplied by this Section and roofed in by the roofing trade, followed by further parapet flashings.
6. Manufactured sectional trim and detail to top of parapets shall be provided by this Section, to detail and shop drawing submission. Standard parapet flashing details to tops of walls and fascias are not acceptable.

### 2. Related Requirements

- |   |                           |
|---|---------------------------|
| 1. Existing Conditions                    | Division 01               |
| 2. Removals                               | Section 024119            |
| 3. Non-Penetrative Safety railing Systems | Section 055200            |
| 4. Rough Carpentry                        | Section 061000            |
| 5. Environmental Separation System        | Section 070500            |
| 6. Modified Bitumen Roofing               | Section 075200            |
| 7. Roof Accessories                       | Section 077200            |
| 8. Joint Protection                       | Section 079000            |
| 9. Mechanical                             | Division 20 & Mech. Docs. |
| 10. Electrical                            | Division 26 & Elec. Docs. |

### 3. Submittals

1. Submit in accordance with Division 1 requirements:
  1. Duplicate 50mm x 50mm (2" x 2") samples of sheet metal material, colour, and finish.
  2. Shop Drawings of all proposed detailing and methods, including for parapet flashings associated with leading edge curved fascias.

### 4. Warranties and Inspections and Maintenance

1. The Contractor and Trade Contractor performing the work of this Section shall warrant all sheet metal flashing and trim work at parapets and upstands, where in proximity to the roofing system, as an integral part of the roofing warranty, inspection, and maintenance procedures as set out in Section 075200.

### 5. Identification of Building Systems

1. The work described by this Section forms components in the Environmental Separation System as described in Section 070010, and as defined in Section 019010. Comply with requirements for the integration of the work described in this Section into its roles in the various systems. Provide the work so that the performance requirements of the overall system of which it forms part is achieved. Trade contractors shall not proceed in uncertainty regarding the role or requirement of the component in relation to the system. Obtain clarification from the Contractor and the Trade Contractor responsible for the system, as set out in Section 019010.

## 2. PRODUCTS

### 1. Flashing & Trim Materials

1. Sheet Steel: Minimum gauge of metal shall be 24 gauge and to greater thicknesses as required to meet tolerances and performance criteria for specific applications and spans.
2. Finish: Pre-finished, high performance, exterior grade, Polyvinylidene Fluoride finish; 10,000 Series by Vicwest or equivalent.
3. Colour: To match existing. Colours may vary. Pre-finished flashings exposed in the finished Work that are new work to existing areas shall be new and colour to match existing removed.
4. Profiles: Form flashings to profiles indicated in Drawings and as required for good drainage practice. Provide all formed pans, ridge pieces, and appurtenances required to accommodate penetrations to roof. Form counter flashings and vertical walls faces with standing seam detailing to both top and front face, for panel connections. Form intermediate folds to details to acceptance of Consultant, for best elimination of oil-canning. Co-ordinate flashing profile at wall base, base of curtainwall or up-stands for complete seal and exit of cavity drainage.

### 2. Accessories

1. Isolation coating: to CGSB 1 GP 108C for bitumen-based roofing systems only.
2. Plastic cement: to CGSB 37 GP 5M.
3. Membrane flashings and all other materials, to Section 075500 as applicable.
4. Sealants: in accordance with Section 079000, colour selected by Consultant.
5. Cleats: of same material, and temper as sheet metal, minimum 2" (50mm) wide. Thickness same as sheet metal being secured.
6. Fasteners: Climaseal with integral seal, colour to match roofing. Use only where concealed methods cannot be used.

### 3. Fabrication

1. Fabricate metal flashings and other sheet metal work in accordance with applicable CRCA 'FL' series specifications and as indicated for concealed areas and roof areas.
2. Form pieces in maximum 8'-0" (2440mm) lengths. Make allowance for expansion at joints.
3. Hem exposed edges on underside 1/2" (12mm). Miter and seal corners with sealant.
4. Form sections square, true, and accurate, free from distortion and other defects detrimental to appearance or performance.
5. Form scuppers to ensure single sheet to all areas affected by water levels, and for compatibility with roofing membrane application.
6. Apply isolation coating to metal surfaces of dissimilar metals.

## 3. EXECUTION

### 1. General

1. Cut all sheet metal flashing and trim products, which will be exposed in the completed project, so that joints in any length are balanced evenly along the run of the building - ie. end panels of any length of exposed trim shall be equal and shorter than central panels.

2. Do not install flashings if positive slope for drainage is not provided in substrates or back-up components. Co-ordinate with other trades for corrective work.
3. Co-ordinate roof penetrations for mechanical and electrical equipment, stacks, feeds, and other required penetrations. Detail and provide cones and flashings to penetrations to ensure positive water flow away and up out of roofing system. Provide membrane flashings fully adhered in addition to, and as backup for, formed sheet metal flashings.
4. Review all drawings and provide all penetrations. Cutting and holing of roofing shall not be done by other trades. Perform all work to roofing assembly as an integral part of the Work, to ensure performance of the Environmental Separation System.
5. Detail all roofing penetrations to allow for movement of roof relative to penetrating element, and for complete insulation to interior of cone. Provide clamped membrane flashings. Co-ordinate with the work of the Mechanical Trade Contractor to achieve required penetrations with complete seal and protection from built-up snow and wind-driven rain.
6. Provide all removals of existing flashings at areas for re-roofing and tie-ins. Provide temporary protection to locations where flashings have been removed until new flashings are installed.
7. Provide new flashings to tops of parapets and to adjacent walls at all existing areas of the building that are to be re-roofed. Note that new flashings to existing areas may have larger profiles to suit additional construction in the re-roofing operation, and that counter-flashing is required to existing roof curbs at existing equipment for all areas of re-roofing. Include all costs for such flashings in the base bid and provisional pricing.

## 2. Installation

1. Install sheet metal work in accordance with CRCA Standards and further as detailed and specified. Work in direct supervision of roofing system manufacturer's representative for all work affecting connection between roofing membrane system and sheet metal. All work to this Section shall be warranted in tandem with the roofing warranties.
2. Use concealed fastenings except where approved before installation.
3. Provide underlay to sheet metal flashings. Secure in place and lap joints minimum 100mm (4").
4. Provide sheet metal finish to up-stand curbs.
5. Crimp end joints of standing seam detailing and vertical faces of existing walls after roofing membrane application.
6. Insert metal flashing into under side of existing through-wall to form weather-tight junctions, above roof level at existing walls.
7. Caulk flashing at cap flashing with sealant only where standing seam detailing cannot be used. Perform any sealant work to the requirements of Section 079000.

## 3. Clean Up

1. Upon completion of work of this section, examine roof areas carefully and remove all loose metal, fasteners, and other debris. Use magnetic detector. The Contractor shall reimburse Owner for any work Owner or Consultant performs to pick up loose fasteners or metal, howsoever left. To avoid these charges, the Contractor shall inspect the roof each time a trade contractor performs work to the roof areas, whether existing areas or new. Maintain roofs during the construction period at no cost to Owner.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.
2. Perform all work to meet requirements of Section 070500 Environmental Separation System.

### 2. Related Requirements

- |                                      |                     |
|--------------------------------------|---------------------|
| 1. Existing Conditions & Removals    | Section 024119      |
| 2. Non-Penetrative Guardrail Systems | Section 052500      |
| 3. Metal Fabrications                | Section 055000      |
| 4. Architectural Metal Fabrications  | Section 057000      |
| 5. Finish Carpentry                  | Section 062000      |
| 6. Environmental Separation System   | Section 070500      |
| 7. Thermal Barrier System            | Section 072000      |
| 8. Weather Barrier Systems           | Section 072500      |
| 9. Modified Bitumen Roofing          | Section 075200      |
| 10. Sheet Metal Flashing and Trim    | Section 076200      |
| 11. Joint Projection                 | Section 079000      |
| 12. Mechanical                       | to Mechanical Docs. |
| 13. Electrical                       | to Electrical Docs. |

### 3. Quality Control

1. Provide all roof accessories to withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.
2. All roof accessories shall be products of manufacturers regularly engaged in producing the types of products specified.
3. Accessories shall be completely assembled to the greatest extent possible before delivery to site.
4. Each accessory type shall be manufactured and made by the same manufacturer.

### 4. Submittals

1. Submit in accordance with Division 1 requirements and:
  1. Shop Drawings: Each item specified showing design, details, installation and fastenings.
  2. Manufacturer's Literature and Data: Each item specified.
  3. Certificates: Stating that aluminium has been given specified thickness of anodizing.
  4. Samples: Representative sample of roof pavers and pathways.

### 5. Contract Closeout

1. Provide operation and maintenance data for all roof accessories to include in maintenance manual in accordance with Section 018050.

### 6. Coordination

1. Coordinate layout and installation of roof accessories with roofing membrane and base flashing and interfacing and adjoining construction to provide a leakproof, weathertight, secure, and noncorrosive installation. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.

7. Warranty

1. Warrant in accordance with Division 01 requirements. Accessories shall be warranted by the Contractor and Supplier and Roofing Trade Contractor in accordance with the manufacturer's warranty, except that the warranty shall be on a replacement basis where Product is defective.

8. Identification of Building Systems

1. The work described by this Section forms components of the following Building Systems as defined in Section 070500. Comply with requirements for the integration of the work described in this Section into its roles in the various systems. Provide the work so that the performance requirements of the overall system of which it forms part is achieved. Trade contractors shall not proceed in uncertainty regarding the role or requirement of the component in relation to the system. Obtain clarification from the Contractor and the Trade Contractor responsible for the system, as set out in Section 019010.
  1. Existing and Means of Egress Systems; and
  2. The Environmental Separation System.

## 2. PRODUCTS

1. Miscellaneous Roofing Accessories

1. Nails: to CSA B111-1974, galvanized roofing nails.
2. Flat caps or disc: flat metal 32mm diameter not less than 0.25mm thick.
3. Sealing compound: to CAN/CGSB-19.24-M80 and as recommended by roofing system manufacturer.
4. Polyethylene back-up rope: extruded closed cell foam, Shore A hardness 20, tensile strength 140 to 200 kPa, compatible with primers and sealants, oversized 30% to 50%.

2. Pre-fabricated Fall Arrest Anchors - N/A this project

1. None existing. No new required.

3. Roof Cones and Seamless Spun Flashings

1. Provide roof cones with appropriate screws and storm collars. Spun cones and purpose-formed flashings for the conditions (sloped roof to vertical, vertical, sumped, or otherwise to suit condition) shall be Thaler or equivalent spun aluminium suitable for existing roofing system assembly, and shall be to recommendations of membrane system manufacturer. All protected membrane stack flashings shall be insulated models. Onsite insulation or foaming shall be supplemental to the insulated model flashing. All stack flashings shall be installed such that the penetrating element is vertical in the completed installation.

4. Stack Flashings

1. Spun aluminium by Thaler Industries, removeable cap, aluminium except where otherwise recommended by roofing membrane system manufacturer. All protected membrane stack flashings shall be insulated models. Onsite insulation or foaming shall be supplemental to the insulated model flashing.
2. Provide roofing cement or set in full bed of liquid membrane as per manufacturer's recommendation.

5. Roof Drains

1. The intent of this Contract is that roof drains are supplied by the Mechanical Trade Contractor, to suit all conditions and sizes including type of roofing membrane and depth of assembly, and are installed by the Roofing Trade Contractor.

2. Review the Documents prior to submitting bids, and ensure roof drains as specified in Mechanical Sections are complete and compatible with roofing system. Where mechanical division has not specified appropriate drain for roofing system, inform Consultant and bidding contractors so that the Contract intent for complete and compatible roof drains can be achieved.
3. Co-ordinate roof drain supply and costing with mechanical trade contractor. Review the roof drain and plumbing submission for compatibility with roofing system. Take delivery of supply and install the roof drain as an integral part of roofing and re-roofing operations.
4. Roof Drains
  1. Standard roof with insulation up to 1-1/2" (38 mm): Thick lacquered cast iron deep sump body, flashing clamp ring with integral gravel stop, press to lock linear polyethylene plastic dome strainer, underdeck clamp and water-proofing flange. Watts RD-100-BD-W-1.
  2. Standard roof with insulation thickness greater than 1-1/2" (38 mm): lacquered cast iron deep sump body, flashing clamp ring with integral gravel stop, press to lock linear polyethylene plastic dome strainer, extension and bearing pan, underdeck clamp and water-proofing flange. Watts RD-100-BED-W-1.
  3. Small Area Roof Drain: epoxy coated cast iron small sump roof drain with wide serrated flashing flange, flashing clamp device with integral gravel stop, adjustable cast iron combined extension and bearing pan, and self-locking polyethylene (standard) dome strainer. Watts RD-200-BED.
6. Eavestroughs and Downspouts:
  1. Min. 6" (150mm) wide by 6" (150mm) deep nominal cross-section or to the sizes as indicated on drawings. Eavestroughs shall be flat bottom, with interior hidden gutter sloped to drain while exterior surfaces are formed to create level appearance consistent with adjacent roof fascias.
  2. Detail and fabricate to suit custom conditions of the roofing system. Interior of gutter shall be smooth and sloped, capable of accepting lapped and continuous roof membrane flashing from under the standing seam roof. Fabricate with straps to connect to existing fascias at maximum 4'-0" (1200mm) centre).
7. Roof Hatches
  1. Not required this Project.
8. Pitch Pockets
  1. Provide where indicated on Roof Plans or on Mechanical Drawings. Provide G-90 (Z275) galvanized sheet steel pitch pan welded watertight, to reach 4" (102mm) above surrounding roof level of pavers, insulation, or membrane, whichever is higher. Steel shall be minimum 16 gauge.
  2. Provide G-90 (Z275) galvanized watertight sheet steel rain collar to overlap penetration pocket and accommodate piping penetrations of the collar.
  3. Pitch pockets for ganged piping shall be purpose-made to surround the complete ganged assembly of penetrating piping or elements, including insulation surrounds. Isolate piping insulation from pitch with compatible membrane wraps to the insulation.
9. Roof Walkways and Pavers
  1. Walkways: Provide additional roof membrane granular cap sheet contrasting walkway paths in accordance with Section 072500, and to the locations indicated on roof plan. Widths of walkways shall be as indicated on drawings, minimum 2'-0" (610mm) for maintenance paths of circulation, and 3'-8" (1,100mm) for pathways forming part of means of egress and exiting.

2. Precast Concrete Roof Pavers:

1. All existing precast concrete unit roof top pavers shall be removed. Dispose all damaged units and excess units. Remove all pavers whether forming maintenance pathways or to full roof areas. Pavers can be repurposed for new locations.
2. Light-weight concrete 24" by 24" (600mm by 600mm) nominal pavers with 12" by 12" (300mm by 300mm) by 2" (50mm) rigid SM insulation pad shared by adjacent pavers, for loose installation to bottom of all rain water leaders (RWLs) and scupper outlets, and where indicated on roof plan.
3. Provide new roof pavers as required to supplement existing salvaged pavers to existing areas for re-roofing and to replace broken units. Supply new insulation pads for all pavers whether new or salvaged.

10. Sealants and Adhesives

1. In accordance with the written recommendations of roofing accessories product manufacturers for the specific product and application in the Project.
2. Sealants shall additionally meet the requirements of Section 079000.

11. Bird Control Devices

1. Not required this Project

12. Rainwater Leaders (RWL)

1. Remove existing portions of rain water leaders as indicated on drawings. Dispose where indicated and supply new. Salvage for re-use where indicated, and modify to re-route as indicated. See elevations and Roof Plan. All RWLs shall be provided complete with returns at grade.
2. Provide new precast concrete splash-pad and direction trough to base of all RWLs located within the interior courtyard. Splash-pads shall be minimum 12" (300mm) wide, by 36" (900mm) long with integral storm channel, sloped at minimum 2% away from RWL discharge opening.

13. Gas Line Supports:

1. Provide gas line supports to all new gas lines, and existing gas lines extended and or modified to suit new roof top mechanical equipment. Ensure supply of new supports to requirements of the mechanical division specification, and co-ordinate installation.

### 3. EXECUTION

1. General:

1. Install roof accessories in accordance with manufacturer's written instructions for the specific condition of use and installation.
2. Only install accessories in weather conditions recommended by manufacturer.
2. Pre-fabricated Fall Arrest Anchors - Existing to remain.
3. Roof Cones, Spun Flashings and Stack Flashings
  1. Install cones, spun flashings and stack flashing at applicable penetrations of roof finish, to roofing system manufacturer's written instructions and as indicated on drawings. Select

flashing for the specific purpose and size of penetrating element. Do not oversize flashings or cut to suit. Use the proper flashing for the condition. Confirm compatibility of flashing metal with membrane system prior to ordering, and co-ordinate heights, positions, and installation with mechanical and electrical trade contractors or other trade contractor requiring the penetration. Use insulated flashings for all inverted roof configurations.

2. Use adhesives and sealants as per roofing system manufacturer's instructions for installation. Details show the minimum work required which shall be further supplemented by the roofing manufacturer's shop drawings.
  3. Provide Clamped flashings to pipe penetrations, in conjunction with roof cones and work described in Section 076200. Ensure pipe or duct movement and required clearances to combustibles is maintained, and provide thermal insulation to interior of cones from the interior ceiling deck level, as mineral wool insulation mechanically held in place to withstand movement of the penetrating element. Do not install foam-in-place insulation to cones and stack flashings where movement of penetrating element is possible.
4. Roof Drains
1. Install as per manufacturer's instruction at locations indicate on drawings, and to details. Protect drains from damage by construction operations that follow the installation, and install accessories prior to final handover of the finished Work to the Owner. Provide Roof drains in strict co-ordination with the Mechanical Trade Contractor and Roofing Trade Contractor, and to suit penetrating component movement. Install flanges within the roofing membrane flashings at time of roofing installation and install drain clamps to positively and continuously reinforce the roofing and drain body connection within the roofing layers.
  2. Co-ordinate the installation of thermal barrier urethane foam insulation to areas around the drain body from the interior, after installation of mechanical piping connection but before pipe insulation application, to remove all possibility of condensation forming on the interior side of the drain body or piping connection area. Mechanical trade contractor shall insulate piping only after acceptance of piping connection to the drain by the Consultant.
5. Gutters and Eavestroughs
1. Install along roof edges as indicated on drawings, and in conjunction with ice and snow guard work and roofing work specified in roofing specifications and sheet metal flashing section. Installation shall be co-ordinated with holing requirements to adjacent exterior wall assemblies for extension of rain leader storm piping into the gutter and completion of custom connections completely concealed within the gutter.
6. Roof Hatch - Not required this project.
7. Pitch Pockets
1. Install pitch pocket where indicated on drawings and further as necessary for penetration of any continuous piping through roof membranes.
  2. Weld sheet metal pitch pan at a minimum height of 4" (102mm) from finished roof surface.
  3. Seal and make watertight after installation of piping. Protect piping insulation and piping from damage related to pitch by wrapping same with protective sealed seaming tape over stainless steel sleeves.
8. Roof Protection Pathways
1. Roof protection pathways are all new this Contract. Provide a new roof protection pathways wherever indicated on drawings, along all designated routes to new roof-mounted equipment. Pathway shall be continuous, excepting only at crossings of gas services to equipment.

9. Bird Control Devices

1. Not required this project.

10. Rainwater Leaders

1. Remove existing portions of rain water leaders where indicated, and as required for re-routing to new roof rather than discharge at grade, and as necessary for installation of new roofing to the lower roof area adjacent.
2. Install lengths of new leaders by salvaging demolished portions of existing, where suitable for re-use, or fabricate new portions to match existing material, colour, and detailing. Provide new brackets to match existing.

11. Gas Line Supports

1. Install new gas line supports to requirements of the mechanical division specification, and coordinate the installation. Installation of gas line supports to new roof areas and existing areas for re-roofing is additionally described in the mechanical sections.

12. Roof Pavers

1. Provide roof paver at base of each existing or new rainwater leader, and wherever new rain water leaders, scuppers, or upper roofs discharge onto lower roofs.
2. Provide pavers to locations and patterns on Roof Plan. Leave 1" (25 mm) gap between pavers that are adjacent to other pavers.
3. Salvage existing roof pavers for re-use in the finished Work, as supplemented by additional new pavers, and provide new pavers as necessary to complete layout. This includes removals, salvage and supply of pavers as necessary for areas of re-roofing.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division One, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.

### 2. Related Requirements

- |  |                      |
|--|----------------------|
| 1. Fire Separation Systems             | Section 019522       |
| 2. Cast-in-Place Concrete              | Section 033000       |
| 3. Masonry                             | Division 04          |
| 4. Metal Fabrications                  | Section 055000       |
| 5. Rough Carpentry                     | Section 061000       |
| 6. Joint Protection                    | Section 079000       |
| 7. Non-Loadbearing Studs and Boardwork | Section 092000       |
| 8. Acoustical Tile Ceilings            | Section 095100       |
| 9. Mechanical Work                     | see Mechanical Docs. |
| 10. Electrical Work                    | see Electrical Docs. |

### 3. Submittals

1. Submit in accordance with Division 1 requirements:
  1. Complete product data and written applications with standard detail drawings and test certification for specific fire-stop situations for this project. This submission must be from the system manufacturer, using accepted test results for all situations encountered in the work, and submitting engineer's opinion proposals for all conditions not specifically covered by a manufacturer's test. Submit to both Consultant and Building Department for review and acceptance prior to performing work of this Section.

### 4. Reference Standards and Codes

1. CAN4-S115-M85, Standard Method of Fire Tests of Firestop Systems.
2. ULC tests for fire-stopping systems in the latest edition.

### 5. Basic Product and Execution Requirements for This Contract

1. All work must be performed to meet ULC & Building Code requirements, and to achieve an equivalent level of protection as the separation or protective membrane penetrated. Additionally, fire-stopping must achieve a minimum fire protection rating for fire separations and fire resistance ratings for 2 and 1 hour separations as applicable, and fire protection ratings of 1.5 hour and 45 minute within protected openings as applicable. In this section, the term "fire separation" shall be deemed to include separations, fire-resistive membranes and assemblies, fire walls, rated closures to openings in such elements, and protective membranes whether assigned a time of resistance or not.
2. This Contract includes the provision of new fire-stopping to penetrations of new system components to both existing and new fire separations, and ALL fire separations wherever identified in the Documents.

### 6. Quality Control

1. All sealant work shall be performed by a single fire-stop trade contractor using application tools and equipment to sealant manufacturer's written acceptance, and with skilled forces having a minimum of three years direct experience in the employ of the sealant trade or similar sealant application trade contractor. The only exception to this qualification requirement shall be by written acceptance of the Owner and commensurate reduction in Contract Price to cover the

cost of independent inspection.

7. Warranties

1. All warranties shall be provided in accordance with Division 1 requirements and GC12.3.1 and 12.3.4 as amended.

8. Identification of Building Systems

1. The work described by this Section forms components in the Fire Separation System as described in Section 019522, and as defined in Section 019010. Comply with requirements for the integration of the work described in this Section into its roles in the various systems. Provide the work so that the performance requirements of the overall system of which it forms part is achieved. Trade contractors shall not proceed in uncertainty regarding the role or requirement of the component in relation to the system. Obtain clarification from the Contractor and the Trade Contractor responsible for the system, as set out in Section 019010.

## 2. PRODUCTS

1. Materials

1. Fire stopping and smoke seal systems in accordance with CAN4-S115:
  1. Hilti FS-1, with full written submission by manufacturer's representative for all conditions in the Work.
  2. Damming and backup materials, supports and anchoring devices: to manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction. Stone wool by Rockwool shall form the standard, with densities to suit application. For steel deck flutes ensure purpose-made shaped closures in coordination with deck supplier.
  3. Equivalent manufacturers and their systems shall only be considered by submission to the Consultant during the Bid period.
  4. All fire-stopping throughout the Work must be of same manufacture and shall be coordinated by the Contractor for one submittal.

## 3. EXECUTION

1. Preparation

1. Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials. Ensure that substrates and surfaces are clean, dry and frost free.
2. Prepare surfaces in contact with fire stopping materials and smoke seals to manufacturer's instructions.
3. Maintain insulation around pipes and ducts penetrating fire separation.
4. Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.

2. Installation

1. Install fire stopping and smoke seal material and components in accordance with ULC certification and manufacturer's instructions.

2. Seal holes or voids made by through penetrations, poke-through termination devices, and un-penetrated openings or joints to ensure continuity and integrity of fire separation are maintained.
3. Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.
4. Tool or trowel exposed surfaces to a neat finish.
5. Remove excess compound promptly as work progresses and upon completion.
3. Acceptance
  1. Notify Consultant when ready for review and prior to concealing or enclosing firestopping materials and service penetration assemblies.
4. Schedule of Locations and Installations
  1. Fire-stop and smoke seal at:
    1. All fire separations in the work.
    2. Penetrations through fire-resistance rated and smoke sealed (0 hr. fire separations) partitions and walls.
    3. Top of fire-resistance rated masonry and gypsum board partitions.
    4. Openings and sleeves installed for future use through fire separations.
    5. Around mechanical and electrical assemblies penetrating fire separations. Coordinate installation with clearance requirements at fire dampers.
    6. Rigid ducts: greater than 129 cm<sup>2</sup>: fire stopping to consist of bead of fire stopping material between retaining angle and fire separation and between retaining angle and duct, on each side of separation. Co-ordinate installation with clearance requirements at fire dampers.
    7. At underside steel deck, at roof assembly, and at wall assembly, to all fire separations, provide backup material and fire stopping to Hilti-recommended details and related ULC Test Designs.
5. Clean Up
  1. Remove excess materials and debris and clean adjacent surfaces immediately after application.
  2. Remove temporary dams after initial set of fire stopping and smoke seal materials.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.
2. All sealant work shall be performed by a dedicated sealant trade contractor with minimum three years experience in similar work, using skilled and trained forces. All sealant work is subject to mock-ups and participation in Pre-installation conferences for the Environmental Separation Systems.
3. Perform all work to meet requirements of Section 070500 Environmental Separation System.

### 2. Related Requirements

1. Contractor shall thoroughly review the requirements described in all Divisions of the specification, and this Section, to ensure that all sealant, caulking, and joint filler work required for the completed Work is assigned and included for best sequencing of construction and best performance by qualified personnel engaged in aspects of the Work. The Work includes multiple mobilization and installation by specialized forces fully skilled in the application of sealants as a designated sealant trade contractor or mechanic.
2. To All Divisions of the Specification: this section is intended to govern all joint protection and sealant work in the Contract, excepting only specialized sealant work within manufactured Products and Curtainwall systems.
3. Refer also to the following Sections (not a complete list)

Concrete	Division 03
Masonry	Division 04
Architectural Woodwork	Section 064000
Solid Surface Fabrications	Section 066100
Fire and Smoke Protection Systems	Section 078400
Interior Finishes	Division 09
Specialties	Division 10
Plumbing Fixtures	see Mechanical Docs.

### 3. Submittals

1. Submit in accordance with Division 1:
  1. Product cuts of all Products proposed for use, as a single submittal from the manufacturer's representative for the complete range of sealant products.
  2. Samples of each type of material and colour as it will appear in the finished Work, mocked up to small portions of the work at beginning of operations for each type of sealing work and joint filling.
  3. Submit qualifications of all sealant applicators upon request of Consultant.
  4. Provide all mockups and sample installations in conjunction with enclosure and finish mockups. Mockups and sample installations do not form part of the finished Work.

### 4. Co-ordination

1. This Section specifies caulking work and sealants that may also be described in other Sections.

2. Refer to other sections for other caulking and sealant work and co-ordinate with work described therein. Work of other sections may specify other sealant products. The most stringent requirement shall govern, subject to selection of sealant products consistently throughout the Work.
3. Sealants must be applied as an integral part of building in items within the Work, so that sealing planes are clean and proper. Schedule portions of sealant work in strict co-ordination with partial assembly of systems for best seal and concealed applications wherever possible, and in accordance with agreed sequences as established by mockup and co-ordination meetings. The contract requires multiple mobilizations for sealants and caulking work to suit the environmental separation system assembly sequence. Further mobilizations are required to achieve performance of the interior finish system and all installations of fabricated items, millwork, and similar.

5. Quality Control

1. All sealant work shall be performed by a single, experienced sealant trade contractor using application tools and equipment to sealant manufacturer's written acceptance, and with skilled forces having a minimum of three years direct experience in the employ of the sealant trade or similar sealant application trade contractor. The only exception to this qualification requirement shall be by written acceptance of the Owner and commensurate reduction in Contract Price to cover the cost of independent inspection.
2. Sealant work performed by "own forces" is not acceptable.

6. Warranties

1. Warranty in accordance with Division 01 requirements, and: =
  1. Sealant Trade Contractor shall directly warrant to the Owner that all sealant work installed at any location in the Environmental Separation System in accordance with GC 12.3.1 and 12.3.4, but as amended by this Section for a period of 3 (three) years following Substantial Performance of the Work.

7. Indoor Air Quality Requirements

1. Requirements for VOC and other characteristics for Products and materials specified in this Section are additionally specified in Section 018080, Indoor Air Quality. Products must conform to these requirements and as follows:

<b>Sealants</b>	<b>VOC Limit (g/L)</b>
Architectural Sealant	250
Non-membrane Roof Sealant	300
Roadway Sealant	250
Single-Ply Roof Membrane Sealant	450
Other Sealant	420

<b>Sealant Primers</b>	<b>VOC Limit (g/L)</b>
Architectural, Non-Porous Sealant Primer	250
Architectural, Porous Sealant Primer	775
Modified Bituminous Sealant Primer	500
Other Sealant Primer	750

8. Identification of Building Systems

1. The work described by this Section forms components in the following Building Systems as defined in Section 019010. Comply with requirements for the integration of the work described in this Section into its roles in the various systems. Provide the work so that the performance

requirements of the overall system of which it forms part is achieved. Trade contractors shall not proceed in uncertainty regarding the role or requirement of the component in relation to the system. Obtain clarification from the Contractor and the Trade Contractor responsible for the system, as set out in Section 019010:

1. Environmental Separation System, to provide components of that system, as described in Section 070500;
2. Interior Finishes System, to provide components of that system; and
3. Exterior Finishes System, to provide components of that system

## 2. PRODUCTS

### 1. Sealant Materials:

1. General Standard of Use within Environmental Separation System assemblies: one part low modulus silicone, Dow Corning DOWSIL 790; or accepted equivalent by Tremco. Contractor to review and select sealants based upon specific conditions, from one manufacturer, using manufacturer's written input as to selection. Only top line construction sealants shall be used. MONO or other consumer products are not acceptable. Where acrylic-based products are proposed for interior use, review and acceptance of Product by Consultant is required together with credit to Contract Price. All colour selections are by Owner from full colour range availability. There are multiple colour requirements in the Work.
2. Butyl to CGSB 19-GP-14M in conjunction with butyl tape use described elsewhere
3. To interior concrete slab sawcut joints, and to complete perimeter of slabs at penetrations: Loadflex by Sika as specified in Section 033000 and herein.
4. Against masonry and concrete: select Sealant product for compatibility with lime rich mortars and ph of concrete.
5. Preformed Compressible and Non-Compressible Back-up Materials: As recommended by sealant manufacturer for best configuration and performance of finished joint for particular material adjacencies. All sealant work requires compressed backup material unless specifically accepted otherwise by the Consultant in each instance.
6. Bond Breaker Tape: polyethylene bond breaker tape that will not bond to sealant.
7. Joint Cleaners: Non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.
8. Primer: as recommended by manufacturer of sealant.
9. Sealants to millwork and counters, plumbing fixtures and similar shall be food-grade approved, mildew resistant pure silicone by GE or Dow-Corning. Multiple colours to be selected.
10. Fire-stop sealants shall be as described in Section 078400.
11. Roofing sealants shall be as described in the specification sections for roof systems.
12. Sealants within glazed areas and interior to manufactured window products shall be in accordance with manufacturer of curtainwall, door, entry, or similar system, to achieve watertightness and air tightness performance of the product. All sealants to perimeter of such systems and product installations shall be in accordance with this section 079000.
13. Sealants used in joint protection work where one side of joint is PVC or TPO surface shall not be bitumen-based and shall be specially formulated for exterior use with PVC or TPO materials.

### 3. EXECUTION

#### 1. Sequencing and Intent

1. Schedule sealing and caulking work at time of build-in of construction items and components. Application of sealants is dependent upon the agreed construction sequence for the overall assembly, and is subject to mockup provisions and multiple mobilization requirements without increase in the Contract Price or Contract Time.
2. Sealant work shall be supplied and installed to complete the Rainscreen primary water control subsystem of the Environmental Separation System, and in all cases shall be installed so that the rainscreen design is maintained with drainage to the exterior at the base of all cavities, including at base of cavity above openings.
3. Sealant work shall be supplied and installed to locations indicated at the lines of Weather Barrier control systems for vapour and air, as a secondary system of control to jointwork and connections between components of the assemblies. Joint sealants shall not form the primary barrier. The primary barrier is established completely by the products and work described in Section 072500, with joint protection as supplementary.
4. Sealant work to the interior and exterior forms part of the Interior Finish System and the Exterior Finish System, and shall be selected and installed for finish and colour, for further paint finish where required, to form smooth and flush surfaces. Installation of sealants as formed corner caulking without backer rod to the joint is not acceptable in any location in the Environmental Separation System assemblies.
5. The Contractor and this Trade Contractor shall review all sequencing and all detailing to ensure that joints have adequate width for installation of backer rod and sealant. Report any installations during the course of the work that do not conform, so the Consultant can identify required remedial measures to be taken by the trades installing the components adjacent the joint. Sealant application as corner bead between adjacent surfaces at right angles to one another is not acceptable. Co-ordinate the Work so that all joints have adequate sizing for installation of backer rod and flush struck joints of width and depth within sealant manufacturer recommended tolerance.
6. It is the intent that sealants within glazed curtainwall and window areas are supplied and installed by the glazing and openings trade. All jointwork at perimeter of these elements shall not be provided by the window trade, but by this Section.
7. Sealant work at roofing assemblies and to walls and parapets at roof shall be performed to the standards of this Section, by the Roofing Trade Contractor. Ensure that Products are fully compatible with adjacent materials at perimeter of roof, including for roofing work to existing portions of the building and for further areas by accepted Provisional Prices.

#### 2. Protection

1. Protect installed work of other trades from staining or contamination.

#### 3. Preparation of Joint Surfaces

1. Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.
2. Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter that may impair work.
3. Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

4. Ensure joint surfaces are dry and frost free.
5. Prepare surfaces in accordance with manufacturer's directions.
4. Priming
  1. Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.
  2. Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.
5. Backup Material
  1. Apply bond breaker tape where required to manufacturer's instructions.
  2. Install joint filler to achieve correct joint depth and shape, with approximately 30% compression and to form consistent profile for back of joint filler.
  3. All joints require backer rod. Corner beaded coved sealant applications are not acceptable. Review the drawing details carefully and ensure adjacent surfaces and Products have been installed so as to leave sufficient gap for backer rod and flush struck jointing.
6. Application of Sealant
  1. Schedule sealant work to occupied spaces for minimal exposure of the public to curing process, and well prior to handover of the work. Sealant work must be complete prior to commencement of building flush-out requirements as set out in Division 1.
  2. Apply sealant in accordance with manufacturer's written instructions.
  3. Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.
  4. Apply sealant in continuous beads.
  5. Apply sealant using gun with proper size nozzle.
  6. Use sufficient pressure to fill voids and joints solid.
  7. Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.
  8. Tool exposed surfaces before skinning begins to give slightly concave shape.
  9. Remove excess compound promptly as work progresses and upon completion.
7. Curing of Sealant
  1. Cure sealants in accordance with sealant manufacturer's instructions.
  2. Do not cover sealants until proper curing has taken place.
8. Cleanup
  1. Clean adjacent surfaces immediately and leave work neat and clean. Remove excess and droppings, using recommended cleaners as work progresses. Remove masking tape after initial set of sealant.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.
2. For doors and frames in Environmental Separation System locations, perform all work to requirements of Section 070500.

### 2. Related Requirements

- |   |                           |
|---|---------------------------|
| 1. Emergency Egress System              | Section 019521            |
| 2. Fire Separation System               | Section 019522            |
| 3. Barrier-Free Path of Travel System   | Section 019530            |
| 4. Cast-in Place Concrete               | Section 033000            |
| 5. Concrete Finishing                   | Section 033500            |
| 6. Masonry                              | Division 04               |
| 7. Metal Fabrications                   | Section 055000            |
| 8. Architectural Metal Fabrications     | Section 057000            |
| 9. Rough Carpentry                      | Section 061000            |
| 10. Finish Carpentry                    | Section 062000            |
| 11. Environmental Separation System     | Section 070500            |
| 12. Thermal Barrier System              | Section 072000            |
| 13. Weather Barrier Systems             | Section 072500            |
| 14. Fire and Smoke Protection           | Section 078400            |
| 15. Joint Protection                    | Section 079000            |
| 16. Wood Doors                          | Section 081400            |
| 17. Hardware to Openings                | Section 087000            |
| 18. Glazing to Openings                 | Section 088000            |
| 19. Non-Loadbearing Studs and Boardwork | Section 092000            |
| 20. Painting and Coating                | Section 099000            |
| 21. Finishes                            | Division 09               |
| 22. HVAC Air Distribution Systems       | Division 20 & Mech. Docs. |
| 23. Electrical                          | Division 26 & Elec. Docs. |
| 24. Communications Systems              | Divisions 27              |
| 25. Security and Access Control Systems | Divisions 28              |

### 3. Submittals

1. Submit in accordance with Division 1 requirements:
  1. Complete detailed shop drawings of doors and hardware. Include door and frame schedules, materials and finishes, hardware preparations and frame anchorage details.

### 4. Co-ordination

1. Work Supplied but whose Installation is by Other Trade Contractor
  1. Supply frames and anchors to those performing work of other Sections where it is necessary to built frames into work of other Sections, for installation by related trades.
  2. Supply instructions to other Trade Contractors as required for accurate positioning and proper installation of components supplied to those trades.
  3. Note that drawings do not show required widths of frames to suit partition and wall conditions and assemblies. The Supplier and the Contractor shall co-ordinate the shop drawing submission to suit all assemblies, and the Contract includes all required widths of frames to suit conditions.

1. Work Described in Other Sections Requiring Co-ordination by this Trade Contractor
  1. The supplier of steel doors and frames under this Section shall co-ordinate and provide door and frame certifications and listings to meet NFPA 80, OBC, and Opening Schedule requirements for protective glazing and frames in rated protected openings. Provide the appropriate label and Listing for the frame and door to suit the ceramic protective glazing (whether UL, WH, or other accepted Listing as required to provide full compliance with protective requirements).
5. Reference Standards and Codes
  1. Unless otherwise specified, meet the requirements of the “Canadian Manufacturing Specification for Steel Doors and Frames” and “Recommended Dimensional Standards for Commercial Steel Doors and Frames” published by The Canadian Steel Door Manufacturers’ Association.
  2. Fire protection requirements: fire rated doors and frames shall bear ULC or WHI label for required rating and shall be installed with NPPA 80 – Fire Doors and Windows, current edition. Provide temperature rise rated assemblies where required by the fire separation designation, and select appropriate certification and label to suit the glass dimensions shown in drawings and schedules.
  3. Insulated metal exterior doors and frames shall at minimum meet the SB-10 prescriptive requirements of the Ontario Building Code.
6. Quality Control
  1. Acceptable manufacturers: Member of The Canadian Steel Door Manufacturers’ Association.
7. Basic Product Requirements
  1. Tag doors and frames at shop with identification indicating proper location for installation.
  2. Deliver, store and handle components so as to prevent damage, distortion and corrosion. Store components off the ground and under cover in a dry protected area. Stack doors and frames to prevent twisting. Do not enclose components in plastic covers without venting.
  3. Co-ordinate frame and door height with floor finishes, and with masonry jointing, to ensure installation provides best fit and operation in each location.
8. Warranties
  1. In accordance with Division 1 requirements and GC12.3.1 and 12.3.4 as amended.
9. Identification of Building Systems
  1. The work described by this Section forms components in the following Building Systems as defined in Section 019010. Comply with requirements for the integration of the work described in this Section into its roles in the various systems. Provide the work so that the performance requirements of the overall system of which it forms part is achieved. Trade contractors shall not proceed in uncertainty regarding the role or requirement of the component in relation to the system. Obtain clarification from the Systems Commissioner responsible for the system:
    1. Emergency Egress System, providing components, as described in Section 019521
    2. Fire Separation System, providing components, as described in Section 019522
    3. Barrier Free Path of Travel System, providing components, as described in Section 019530
    4. Environmental Separation System, providing components, as described in Section 070500
    5. Interior Finishes System, providing components of that System, as per Section 090500
    6. Security and Door Access Control Systems, as further described in Divisions 27 and 28.

## 2. PRODUCTS

### 1. Materials

1. Sheet Steel: hot dipped galvanized (wipe coated) cold rolled steel with stretcher level degree of flatness, meeting requirements of ASTM A924M-16 and ASTM A A653M-15e1, minimum zinc coating designation ZF120.
2. Sheet Stainless Steel for stainless door frames where indicated: S316 Stainless, 1.5 mm thick. Note that S304 stainless is not acceptable for stainless door frames.
3. Core materials:
  1. Fire rated doors: in accordance with fire test requirements.
  2. Exterior doors: rigid urethane, stone mineral wool, or glass fibre insulation.
4. Finishing materials:
  1. Touch up paint: zinc rich paint CAN/CGSB-1.181-92.
  2. Metal filler: two-component epoxy type.

### 2. Hardware Preparation

1. Obtain full hardware specifications and list, as well as templates, prior to final fabrication of doors and frames. Co-ordinate all preparation with this list and review Contract Documents for potential discrepancies. Report any discrepancies to the Consultant for instruction.
2. Prepare for cylindrical hardware, in strict co-ordination with hardware schedule, except where specified otherwise. Provide cylindrical lock preparation to ANSI A115.2, including integral latch case support.
3. Blank, reinforce, drill and tap doors and frames for concealed and mortised hardware. Reinforce doors and frames for surface mounted hardware. Provide door closer reinforcement at all steel doors and frames whether closer is required by hardware list or not. Provide exterior doors and frames to receive alarm system contact switches.
4. Prepare for routing of cabling for door access control systems and intrusion detection systems, as well as electric strikes and other interfaces with hardware, doors, and frames, so that all such cabling can be easily field installed after initial frame install.

### 3. Steel Doors

1. Construct fire rated doors in accordance with fire test requirements. Provide astragals at fire rated pairs of doors. Doors located in firewalls shall be temperature rise rated and labelled as required by regulatory requirements.
2. Exterior doors and doors in assemblies separating conditioned spaces from unconditioned spaces shall be of hollow steel construction with all spaces filled with insulation. Skins shall be 1.5 mm thick.
3. Join door face sheets at vertical edges by tack welding. Render joints invisible by filling, grinding and dressing smooth; mechanically locked joints are not acceptable.
4. Provide condensation weep holes at bottom edge of exterior door. Provide flush cap to top.
5. Provide flush watertight galvanized steel and closures at top edge of exterior doors and where required for attachment of hardware and weather-stripping.
6. Hardware reinforcements shall be minimum 3.4 mm thick in addition to door skin thickness. Provide continuous reinforcement at continuous hinges.

7. Surround glazed and louvered openings in flush doors with 1.2 mm thick steel edge channels, welded to both face sheets.
  8. Provide removable glazing stops of zinc coated steel channels butted at corners, accurately fitted into position and fastened with oval head Philips screws.
  9. Glazing stops at outside of exterior doors shall be non-removable.
4. Frames and Screens – Welded Type (SUW)
1. Unless existing assemblies do not allow for the installation of set-up and weld frames, provide setup and weld frames for frames and screens. Provide set-up and weld frames for use in all masonry openings, regardless of whether existing or new. Provide T-style centre mullions. Form glass and door stops integrally with frame; do not add as a separate profile. Ensure prep is for minimum 6 mm glass in all cases, except where glazing units are double-glazed. For double-glazed units, form integral stop such that glazing unit centres on the door or screen thickness.
  2. Assemble components with accurately cut joints. Mitre outside corner joints of frames continuously. Weld joints for SUW frames on inside of profile; grind welds, flush and sand to smooth uniform surface. Tabbed and spot-welded construction is not acceptable.
  3. Fit and assemble work in the shop wherever possible, eliminating field joints.
  4. Glazing stops for screens shall be minimum 0.9mm thick steel, mitred at corners, drilled and secured with oval head screws.
  5. Side lite and transom framing shall be of same thickness metal as adjacent door frame.
  6. Drill interior door frames for rubber bumpers. Drill strike jamb of each single door frame for 3 bumpers. Drill head member of double door frames for 2 bumpers.
  7. Provide angle or channel door head reinforcement for doors wider than 915 mm.
  8. Tack weld two removable minimum 1.2 mm thick steel spreader channels to inside faces of door frames at base, for all set-up and welded frames.
  9. Provide adjustable base clips for anchorage to floor at bottom of each door jamb.
  10. Protect hardware reinforcements at frames in masonry elements with 0.9 mm guard boxes.
  11. Hardware reinforcements shall be minimum 3.4mm thick exclusive of frame thickness. Provide hardware reinforcement at all hardware fastening points.
  12. Fabricate frames, screens and sidelites with due attention to interior finishes. Where high bases are shown to floor height sidelites or added height to head is shown for masonry joint co-ordination provide such configurations as included in the base requirements of the Contract and Contract Price.
5. Frames – Knocked-Down (KD) Type
1. Ship knocked-down type frames unassembled.
  2. Provide frames with mechanical joints which inter-lock securely and provide functionally satisfactory performance when assembled and installed in accordance with CSDFMA Recommended Installation Guide for Steel Doors and Frames.
  3. Securely attach floor anchors to inside of each jamb profile.
6. Frames - Slip-On Type
1. Ship slip-on type frames unassembled.

2. Provide frames with mechanical joints which inter-lock securely and provide functionally satisfactory performance when installed in accordance with CSDFMA Recommended Installation Guide for Steel Doors and Frames and manufacturers' instructions.
  3. Provide slip-on frames with manufacturers' proprietary design of wall anchorage comprising single, adjustable tension type per jamb and provision for secure attachment of each jamb base to stud runners.
7. Finishes
1. Fill seams, corner joints and other depressions with filler and sand smooth.
  2. Clean and remove all traces of oil, grease and other foreign substances to ensure proper bond of touch up after fabrication.
  3. Touch up damaged zinc coating with zinc rich paint.
  4. Isolate, where necessary to prevent electrolysis, metal surfaces in contact with dissimilar metals or cementitious materials.

### 3. EXECUTION

1. Installation General
  1. Installation shall be by the finish carpentry trade, except set-up and welded frames, which shall be built in by the relevant wall/partition trade contractor.
  2. Install labelled steel fire-rated doors, screens, and frames to NFPA 80 except where required otherwise by the Listing for the opening. The most stringent requirement shall apply, including requirements of the supplied ceramic fire-protective glazing to suit opening sizes in doors and frames.
2. Frame Installation
  1. Allowable limit of distortion shall be 1.5 mm out of plumb at each jamb, measured on face of frame, resulting in maximum twist of frame of 3 mm measured from upper corner to lower diagonal corner.
  2. Generally, anchorages of frames shall be by means of standard anchors for each jamb material condition. Where standard anchors cannot be used, provide special anchors to ensure proper installation.
  3. Provide minimum 3 anchors at each jamb. At frames exceeding 2150 mm in height provide one additional anchor for each additional 610 mm, or part thereof.
  4. Anchor immediate intermediate vertical frame members to structure above as required to ensure stability. Where required, provide steel frame extensions. Provide flexible connection at structure to allow for deflection.
  5. Remove steel shipping spreaders to SUW frames; install wood installation spreaders at sill and at third points of frame rabbet height to maintain constant frame width. Remove wood spreaders only after frames are securely anchored in place.
3. Touch-up
  1. Patch damaged shop galvanizing. Remove rust. Sand damaged and abraded surfaces and touch-up with zinc rich paint.
4. Glazing

1. Install glazing for doors in accordance with Section 088000 - Glazing.
2. Glazing stops for doors shall be painted while removed and prior to glazing. Do not under any circumstance allow finish painting of frames with stops in-situ or prior to glazing operations. Failure to comply with this requirement will mean that all stops and glazing shall be removed, all surfaces re-prepared and sanded smooth, and all stops and glazing re-installed after acceptance of paint finishes.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division One, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.
2. Provide all Hardware complete, as part of this Contract. No exceptions.

### 2. Related Requirements

- |                                       |                          |
|---------------------------------------|--------------------------|
| 1. Emergency Egress System            | Section 019521           |
| 2. Fire Separation System             | Section 019522           |
| 3. Barrier Free Path of Travel System | Section 019530           |
| 4. Removals                           | Section 024119           |
| 5. Concrete                           | Section 033000           |
| 6. Rough Carpentry                    | Section 061000           |
| 7. Finish Carpentry                   | Section 062000           |
| 8. Architectural Woodwork             | Section 064000           |
| 9. Doors and Frames                   | Section 081113           |
| 10. Glazing to Openings               | Section 088000           |
| 11. Interior Finishes System          | Section 090500           |
| 12. Floor, Wall & Ceiling Finishes    | Division 09              |
| 13. Toilet and Shower Partitions      | Section 102100           |
| 14. WC Accessories                    | Section 102800           |
| 15. Hardware for Mechanical           | See Mechanical Documents |
| 16. Hardware for Electrical           | See Electrical Documents |
| 17. Communications Systems            | Section 270500           |
| 18. Security Systems                  | Section 280500           |
| 19. Fire Detection & Alarm Systems    | Section 283100           |

### 3. Submittals

1. Submit in accordance with Division 1 requirements:
  1. A detailed hardware schedule for all Openings in the Work. Include all hardware howsoever supplied. The Contract includes for the initial hardware schedule submission, to be reviewed with Owner, Consultant, Contractor, Hardware supplier(s) and applicable Systems Commissioners, to review all hardware performance and integration requirements in the Work. Following meeting, revise and resubmit final hardware schedule as may be required.
  2. Meet with Owner and determine keying system. Prepare and submit keying schedule.
  3. Record of inspection for all rated doors after inspection. Provide an inspection by a certified door and hardware inspector qualified under NFPA to provide such inspection and submit copy certifying installation of the doors, frames, and hardware to meet the latest standards for such fire protected openings.
  4. Submit Product information for all hardware.

### 4. Co-ordination

1. Hardware described Elsewhere:
  1. Hardware for Architectural Woodwork is described in Section 064000.
  2. Hardware for windows is described in Division 8, except as noted herein.
  3. Hardware for Toilet and Shower Partitions are described in Section 102100.

## Hardware to Openings

2. Furnish all templates required for hardware preparation and installation. Issue templates when requested so as not to cause any delays, but not before final review of hardware list by Consultant.
  3. Co-ordinate installation of hardware to follow finishing and painting work, not before.
  4. Co-ordinate installation of hardware with glazed openings.
  5. Co-ordinate delivery and installation of hardware to achieve construction sequencing and the handover of areas of the completed work to the Owner without temporary hardware. In case of delivery failure, provide temporary hardware at no cost to Owner.
5. Reference Standards and Codes
1. Standard hardware location dimensions in accordance with Canadian Metric Guide for Steel Doors and Frames (Modular Construction) prepared by Canadian Steel Door and Frame Manufacturers' Association.
  2. Meet requirements of Ontario Building Code and other applicable regulations, including accessibility standards.
  3. Hardware for doors in fire separations and exit doors certified by a Canadian Certification Organization accredited by Standards Council of Canada and recognized in the OBC.
6. Basic Product Requirements
1. Deliver each hardware item packaged separately in individual containers with necessary screws, keys, instructions and installation templates.
  2. Mark each container with item number corresponding to number shown on hardware schedule with respective door number.
  3. Store hardware in locked, clean and dry area.
7. Basic Execution Requirements
1. The Work of this Section shall be performed by finish carpenters and mechanics experienced in hardware installation, in conjunction with work described in Sections 062000, 08113 and 081400.
  2. Upon completion of finish hardware installation, hardware supplier's qualified representative shall inspect work and shall certify in writing that all items and their installation are in accordance with requirements of Contract Documents and are functioning properly. This document shall be included in the Maintenance Manuals.
8. Maintenance Manuals and Materials
1. Submit in accordance with Division 1 requirements:
    1. Operation and maintenance data for door closers, locksets, door holders and fire exit hardware for incorporation into manual.
    2. Brief maintenance staff regarding proper care, cleaning, and general maintenance.
    3. Two sets of wrenches for door closers. Deliver directly to the Owner. Under no circumstances leave at the job site.
    4. Hardware Supplier's written certification of all hardware.
    5. Final as-built hardware and keying schedules.

9. Warranties

1. Warrant in accordance with Division 1 requirements and GC12.3.1 and 12.3.4, and all Product supplied under this Section shall have manufacturer's warranties duly executed and provided to the Owner in accordance with Division 1 requirements and GC12.3.6.

10. Identification of Building Systems

1. The work of this Section forms components in the following Building Systems. Comply with requirements for the integration of the work described in this Section into its roles in the various systems. Provide the work so that the performance requirements of the overall system of which it forms part is achieved. Trade contractors shall not proceed in uncertainty regarding the role or requirement of the component in relation to the system. Obtain clarification from the Contractor and the Trade Contractor responsible for the system:
  1. Emergency Egress System, to provide components of that system
  2. Fire Separation System, to provide components of that system
  3. Barrier Free Path of Travel System
  4. Environmental Separation System, to provide components of that system
  5. Interior Finishes System, to provide components of that system
  6. Access Control and Intrusion Detection System

## 2. PRODUCTS

1. General

1. Use one manufacturer's products only for all similar items.
2. Work to provide blocking within stud walls for hardware installation is by Section 061000.

2. Lock-sets, Latch-sets and Rim Cylinders

1. Best keyway to suit Owner's key system. No other lock-sets or latch-sets permitted.

3. Keying

1. Locks shall all be to Owner's master key system, to Owner's instructions. Deliver keys to Owner only, and obtain signed receipt for delivery. Submit copy of receipt to Consultant and Owner.
2. Locks and cylinders shall be construction master keyed only where there is significant lag time between door installation and handover to the Owner.

4. Hinges

1. All Hinges, except for spring hinges, shall be 2 or 4 race ball bearing. Interior hinges shall be satin chrome plated (C26D) sized according to door height and weight and frequency of operation. All exterior hinges shall be solid brass dull chrome plated or stainless steel complete with non-removable pins (NRP). Concealed bearing hinges are not acceptable. Stanley FBB179.
2. Continuous Hinges shall be full surface, heavy duty, 780-157HD, Hager.
3. Spring Hinges (S), for all shelter sleeping rooms (a.k.a Rooms) and as scheduled, shall be Stanley 2060 series hinges, sized according to door height, weight and frequency of operation, full mortise suitable for use in rated assemblies as as closure device permitted by OBC.

5. Stops

1. Wall Stops (WALL) shall be heavy duty, spring type, stainless steel, for wall mounting at base of doors (installed above elevation of wall bases), Stanley or equivalent.

2. Additionally, wherever wall stops are scheduled on Openings Schedules, additionally provide 6" (150mm) or larger diameter, high impact wall guards, white vinyl, adhered type.
2. Overhead (O/H) stops shall be heavy-duty, 904S.
3. Floor Stops are not required as part of this project.
4. Kick Down (KDH) Holders shall be Glynn Johnson GJ 44, 26D.
6. Kick-plates and Edge Guards
  1. Kick Plates: Stainless Steel, GSH 80A or equivalent, 200mm (8") tall, width to suit door.
  2. Edge Guards: Stainless Steel, door channel type, full height to suit door, CBH 430 or equiv.
7. Push-plates & Door Pulls
  1. Hagar #30S, 100mm x 400mm (4" x 16") with screws, 630 finish and Hagar #9J, 630 finish.
  2. All push plates and pulls to aluminium storefront, curtainwall entries shall be provided by the storefront or curtainwall Trade Contractor.
8. Thresholds
  1. Certified, HC accessible, low-profile, extruded aluminium K.N. Crowder CT-11, depth to suit condition, fully coordinated with flooring requirements for smooth transitions.
9. Closers
  1. Surface mounted unless otherwise noted, handed and non handed, sized to operate door efficiently and to suit swing of doors, c/w back checking features. For pull side mounting use 4010 Series. For push side mounting use 4110 Series. For top jamb mounting use 4021. For on high frequency doors model 4030 Series may be used. Equivalents by Sargent are acceptable.
10. Exit Devices (ED)
  1. Sargent 8800 Series complete with 16 prefix, cylinder dogging except where exits are specified on UL rated doors. All devices shall be stainless steel. Vonduprin 98 series shall be equivalent.
  2. Bosch DS160 Bosch Right to Exit Sensor.
11. Weather-stripping/Sound Seals
  1. To all exterior doors, doors between conditioned and unconditioned spaces, and doors scheduled to receive acoustic seals, K.N. Crowder Mfg. Inc. W32N, clear anodized aluminium, complete with snap on cover to conceal fasteners and closed cell sponge neoprene.
  2. To interior doors scheduled to receive seals, provide purpose-made neoprene and nylon acoustic seals suitable for recording studio openings.
12. Automatic Door Bottoms
  1. To all doors scheduled to receive acoustic seals, surface mounted, K.N. Crowder CT50 clear anodized aluminium, complete with neoprene seal.
13. Surface Bolts
  1. Glynn Johnson #1631 and 1632, mounted at top and bottom of door as indicated on drawing

14. Flush Bolts

1. Glynn Johnson #FB6 spring loaded snap action lever, 5/8" throw with 7/8" vertical adjustment, made from forged brass, and shall bear UL and Warnock Hersey listed for labelled door.
2. Flush-bolts shall be top and bottom for one leaf of all double doors, co-ordinated with exit devices. Where door is not scheduled for exit device, provide recess flush bolts, heavy duty.

15. Automatic Door Operators (ADO)

1. Gyro Tech complete with manual LCN closer independent of motor or electronic controls, wherever scheduled. Operator shall be installed by the authorized dealer. Equivalents by Record and Besam shall be acceptable. Please note that Gyrotech refers to Gyrotech/Nabco as well as Gyrotech.
2. Gyrotech Model 710 shall be for interior door locations only. For exterior door locations provide Gyrotech Model 8710 exterior grade unit, complete with all specified accessories and functionality. Provide Universal Washroom unit with associated "push to lock" and interface as well as the button operators. Interlink all auto door operators with electric strikes.
3. All auto operators must be capable of receiving wireless signal from HC Push Buttons, or wired, at Consultant option, and must accept control from Door Access Control system and co-ordination signalling among HC button system and security control system.

16. Electric Strikes (ES)

1. Electric Strikes shall be fully compatible with Owner security card reader system. Ensure compatibility prior to ordering Products, at submission stage. Strikes shall be co-ordinated with exit devices and card readers. Contractor must co-ordinate door and frame prep to allow for wiring rough-in.
2. Electric Strikes shall be supplied and installed by the Electrical Trade Contractor in Contract, including all prep and wiring. Strikes shall be co-ordinated with exit devices, and door and frame prep to allow for wiring rough-in and shall provide all prep for frames to accommodate hardware and devices. The Contractor and Electrical Trade Contractor shall include all costs for co-ordinating frame rough-ins and frame preparations with the door and frame providers in each case. All conduit and wiring for electric strikes is included in the Contract.
3. Electric Strikes shall be:
  1. HES - 9600-630: 9600 12/24 630 STRIKE
  2. HES - 1600-CLB-630: HES Low Profile, 12/24 Volt DC

17. Accessible Push Button Switches (PB)

1. LCN 8310-836TW, wireless, to interiors.
2. LCN 8310-836T, to exterior locations with 8310-844 9v transmitter kit.
3. All switches to be 6" (150mm) wide by 36" (900mm) high door activation switch. At exterior door to main entrance, provide LCN 8310-866FLA bollard post. Otherwise provide all mounting hardware and accessories for wall mount to OBC compliant location adjacent door. All switches shall be battery operated with wireless control to Auto Door Operators.

18. Card Readers (CR)

1. All Card Access Readers shall be supplied and installed by the Owner's Access Control and Instruction Detection System Contractor following construction and are devices of the Security Systems, as set out in 087000 & 280500, Costs for the provision of such devices are therefore not in Contract.

2. Notwithstanding, the Work or this Contract includes all conduit and wiring work for control and interface of Card Readers, as well as all coordination of system components to ensure complete and functional security system rough in and wiring with electric strikes, by the Electrical Trade Contractor, and all coordination of system components is by the GC working with the door hardware supplier, the door supplier and the Owner's Door Access Control Contractor.
19. Hold Open Devices
  1. LCN SEM 7830 Magnet Surface wall mounted c/w interrupt switch, tied into fire alarm system.
20. Door Bumpers
  1. Glynn-Johnson FB 13, 26D, for each new door.
21. Lock Protectors
  1. Glynn-Johnson model LP3, c/w prime painted finish.
22. Blank-out Kits
  1. Shall be #161 Filler Plates, painted to match door.
23. Removable Mullions
  1. L980A anodized aluminium for non fire rated applications, 12-L980 steel for fire rated openings, EL-890 steel for monitor or electric strikes; complete with cylinder.
24. Exterior Door Pulls
  1. As specified in 084413.
25. Magnetic Hold Opens (MHO)
  1. LCN SEM 7830 Magnet series or equivalent, fully compatible with existing fire alarm system. Ensure compatibility prior to ordering. Magnetic Hold Opens shall be provided by the Fire Alarm Trade Contractor, and interlinked with existing FA System.
26. Electro-Magnetic Locks (Mag-locks)
  1. As provided by the Fire Alarm Trade Contractor, interlinked with FA System. Provide complete with all signage. Interlink with Owner's card access control system, to release upon activation. Provide all conduit and wiring as may be required to ensure this performance.
27. Emergency Call Assist Systems
  1. Camdon Door Controls, System Cx-WEC series or equivalent.
  2. Interlink with PTL and ADO to all barrier-free and Universal Washrooms.
  3. Provide stand-alone call assists systems to all non-barrier-free patient washrooms. Coordinate with electrical for rough-in of conduits and device boxes.
  4. Signage for Emergency Call Assist System is described in Section 102800.
28. Fasteners
  1. Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.
  2. Exposed fastening devices to match finish of hardware.

3. Where a pull is scheduled on one side of door and push plate on the other, supply fastening devices, and secure pull through door from reverse side. Install push plate to cover fasteners.
4. Use fasteners compatible with material through which they pass.
5. Exposed screws for installing hardware shall have tamper proof heads.

### 3. EXECUTION

#### 1. Installation

1. Furnish metal frame and metal door manufacturers with complete instructions and templates for preparation of their work to receive hardware.
2. Furnish manufacturers' instructions for proper installation of each hardware component.
3. Meet requirements of ANSI/DHI A115.1 G-94 "Installation Guide for Doors and Hardware".
4. Install finish hardware in accordance with hardware supplier's directions. Ensure that hardware is installed correctly. Issue instructions if required to Sections concerned.
5. Unless otherwise directed by the Consultant, or unless otherwise dictated by glass height or rail location, install finish hardware at the following heights above finish floor:

1. Lock-sets and Latch-sets	1,025mm to centre of strike
2. Deadlocks	1,200mm to centre of strike
3. Panic Bolts	1,025mm to underside of push bar
4. Push Plates	1,065mm to centre of plant
5. Guard Bars	1,065mm to centre of bar
6. Door Pulls	1,065mm to centre of pull
6. Where door stops contact door pulls, mount stop to strike bottom of pull.
7. Install permanent cores and check operation of all locks.
8. Do not install wall stops on drywall partitions without blocking support.
9. Notwithstanding the above, ensure that all hardware in accordance with OBC accessibility requirements, and the Barrier-Free Path-of-Travel System.

#### 2. Schedule of Installation (Not Necessarily a Complete List)

1. Install Finish Hardware according to the Openings Schedule and accepted hardware schedule, and in strict accordance with manufacturers' instructions and Code regulations.
2. Install hardware to all doors and frames, as described in Section 062000.
3. Provide all hardware to accomplish the intent of functions and as scheduled in the Openings Schedules for this Work. All minor items of accessory necessary and reasonably inferable to complete the hardware and to achieve door performance are included in the Work, at no further cost to the Owner. Only supply of keys and lock cylinders are exempt from this requirement.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division One, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.

### 2. Related Requirements

- |   |                |
|---|----------------|
| 1. Emergency Egress System              | Section 019521 |
| 2. Fire Separation System               | Section 019522 |
| 3. Barrier Free Path of Travel System   | Section 019530 |
| 4. Removals                             | Section 024119 |
| 5. Rough Carpentry                      | Section 061000 |
| 6. Finish Carpentry                     | Section 062000 |
| 7. Joint Protection                     | Section 079000 |
| 8. Steel Doors and Frames               | Section 081113 |
| 9. Door Hardware                        | Section 087000 |
| 10. Interior Finishes Systems           | Section 090500 |
| 11. Non-Loadbearing Studs and Boardwork | Section 092000 |
| 12. Painting and Coating                | Section 099000 |
| 13. Installation of Building Signs      | Section 101400 |
| 14. Window Films                        | Section 125250 |

### 3. Submittals

1. Submit in accordance with Division 1 requirements:
  1. Detailed product data for each product required.
  2. Duplicate samples of every colour and pattern and type of glass required in the Work, unless it is specified in other Sections.
  3. All trade contractors performing work described in this Section, or incorporating glazing, shall submit a reviewed and accepted copy of all shop drawings pertaining to such items that incorporate glazing as components.

### 4. Co-ordination

1. Co-ordinate delivery and installation of glazing to achieve construction sequencing and the handover of areas of the completed work to the Owner without temporary glazing. In case of delivery failure, provide temporary glazing at no cost to Owner.
2. Cooperate with Owner's Signage Supplier, who shall provide interior signage where mounted to glazing to Openings from expenditure from Cash Allowance.

### 5. Reference Standards and Codes

1. ASTM-D2240-97, Standard Test Method for Rubber Property-Durometer Hardness.
2. ASTM-E84-98, Standard Test Method for Surface Burning Characteristics of Building Materials.
3. ASTM-E330-97, Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.
4. CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass.
5. CAN/CGSB-12.3-M91, Flat, Clear Float Glass.
6. CAN/CGSB-12.8-M90, Insulating Glass Units.
7. CAN/CGSB-12.9-M91, Spandrel Glass.
8. CAN/CGSB-12.20-M89, Structural Design of Glass for Buildings.
9. CAN/CGSB-19.13-M87, Sealing Compound, One-Component, Elastomeric Chemical Curing.
10. CAN/CSA-A440.2-09, Fenestration Energy Performance.

11. Insulating Glass Manufacturers Alliance (IGMA), Glazing Guidelines for Sealed Insulating Glass Units, 1997.
  12. Glass Association of North America (GANA), Glazing Manual, 2005.
  13. NFRC-100-2010, Procedure for Determining Fenestration Product U-Factors.
  14. NFRC-200-2010, Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence.
  15. NFRC-400-2010, Procedure for Determining Fenestration Product Air Leakage.
  16. NFPA 80 - 2019, Standard for Fire Doors and Other Opening Protectives
6. Quality Control
    1. Follow recommendations of the Flat Glass Marketing Association (USA) "Glazing Manual" latest edition.
    2. Every pane of glass shall be factory labelled and label shall remain in place until final cleaning. Safety glass, and protective glass in rated openings shall have permanent identification.
    3. Laminator qualifications: approved by interlayer manufacturer.
    4. Installation of glass shall be by qualified glazier journeyman. Where glass is installed in openings having fire-protection rating, the installation forces shall be trained and certified by the supplier of the Listed and rated glass product.
7. Basic Product Requirements
    1. Handle materials with care damage to surfaces.
    2. Wrap in protective paper and removable plastic coating for shipping and installation. Protective plastic coating shall remain in place until instructed by Consultant to remove.
    3. Store materials whether new, for alteration, or for re-use, off ground, under cover, protected from scratches or other damage and other construction activities. If broken, damaged, or defective replace at no cost to owner.
8. Warranty
    1. In accordance with Division 1 requirements and GC12.3.1 and 12.3.4 as amended, and further:
      1. All ceramic glass for use in fire protection for openings shall be warranted for conformance with NFPA 80 and performance to UL or ULC testing. Note that the particular supply of Listed protective glazing must correspond with requirements of the frame listing. Warranty shall not be voided by any such discrepancy in the finished installation, no matter the cause.
9. Maintenance Manuals
    1. Provide maintenance data including cleaning instructions for incorporation into manual as described in Division 1.
10. Building Systems Requirements
    1. The work described by this Section is a component of the following Systems. Comply with requirements for the integration of the work described in this Section into its roles in the various systems. Provide the work so that the performance requirements of the overall system of which it forms part is achieved:
      1. Emergency Egress Systems;
      2. Fire Separation Systems;
      3. Barrier Free Path of Travel Systems;
      4. Environmental Separation Systems (when used in Exterior Wall components); and
      5. Interior Finishes System.

## 2. PRODUCTS

### 1. Materials

1. Setting blocks: neoprene, Shore 'A' durometer hardness of 70 to 90 points, spacer shims, 40 to 50 points, and as recommended in writing by glass manufacturer for the specific glazing condition.
2. Glazing Sealant: one part silicone to CAN/CGSB 19.18 M87, and to meet the requirements of Section 079000. Dow Corning 790 or equivalent.
3. Glazing tape: polyisobutylene tape; acceptable product: Tremco 440 tape.
4. Glazing gasket: Tremco Vision Strip; colour selected by Consultant.
5. Tempered Glass: fully tempered float glass to CAN/CGSB-12.1-M90. Tempered glass identification must be sandblasted into glass and shall be visible after installation.
6. Laminated glass: clear and tinted laminated tempered float glass with PVB interlayer, to CAN/CGSB-12.1-M90.
7. Wired Glass (GWG or equivalent) - Not permitted for use this project.
8. Ceramic Fire Glass to Protected Openings:
  1. Standard of Acceptance: "FireLite NT" by Technical Glass Products or equal by "Pyran Platinum L" by Schott North America, or "Keralite L" by Vetrotech Saint-Gobain.
  2. All glass to protected openings shall be provided to suit opening sizes, with appropriate Listed and tested product that is acceptable to latest NFPA 80 Standard and authorities having jurisdiction.
  3. For further clarity, suppliers of glazing to this Section must carefully review opening sizes in door and frame types and the Openings Schedule located on Drawings. All supply of rating to suit the size of frame opening is included in the work of this Contract. Where Listing of the frame, door, sidelite, or protected opening requires a particular equivalent Listing for the glass, provide such glass and include all costs to achieve the size and configuration shown.
9. Float glass: clear float glass to CAN/CGSB-12.3-M91, Glazing Quality; unless otherwise shown.
10. Mirror glass - Not permitted for use this project. For Mirrors see Section 102800.
11. Double-glazed sealed units for Glazing to Exterior Doors shall match glazing described in Window and/or Curtainwall sections, except it shall be provided under this Section and shall be minimum 6mm tempered glass each pane.

## 3. EXECUTION

### 1. Framed Glass Installation General

1. Do not glaze when ambient or surface temperature is less than 5°C. Ensure that glazing rabbets, stops and glass are dry, free of frost, grease, oil, dust, rust and other substances detrimental to adhesion of compounds and sealants.
2. Provide clearance at perimeter edge of glass on all four sides, minimum equal to glass thickness. Accurately cut glass to fit openings, allowing for expansion in accordance with glass manufacturer's recommendations.

## Glazing to Openings

3. Provide sealer space between face of glass and glazing stops of minimum 3 mm.
4. Clean sealing surfaces at perimeter of glass and sealing surfaces of rabbets and stop beads before applying glazing tapes, gaskets and compounds. Use solvents and cleaning agents recommended by manufacturer of sealing materials.
5. Install glazing tapes uniformly with accurately formed corners and bevels. Ensure that proper contact is made with glass and rabbet surfaces.
6. Set glass on setting blocks, spaced as recommended by glass manufacturer. Provide at least one setting block at quarter points from each corner.
7. Centre glass in glazing rabbet to maintain specified clearances at perimeter on all four sides. Maintain centred position of glass in rabbet and provide the required sealer thickness on both sides of glass.
8. Use spacers and shims in accordance with glass manufacturer's recommendations.
9. Ensure that steel, aluminium and wood glazing stops are pre-finished loosely and on all surfaces prior to beginning glazing operations. Where stops have been finished "insitu" report this defect to the Trade performing such finishing work. Upon sanding and refinishing of frames and loose stops, or replacement of stops where the defect cannot be remedied, begin glazing operations.
10. Mark each pane of glass to indicate presence of glass during construction.

### 2. Interior Glazing

1. Unless otherwise indicated, glaze interior openings by: Applying glazing tape to permanent stop; centre glass in opening and set on setting blocks; apply glass and press against tape. Apply glazing tape to removable stops and install stops. Trim tape for neat appearance.

### 3. Cleaning

1. Remove dirt, scum, plaster, paint spatter, and other harmful and deleterious matter from glass promptly and completely, before they establish tight adhesion. Avoid abrasives, steel wool, razor blades, solvents, alkaline or harsh cleaning agents. Remove glazing compound droppings promptly from all surfaces as the work progresses. Replace scratched or otherwise damaged glass prior to final handover of the Work, regardless of how caused, at no cost to Owner.

### 5. Schedule

1. Provide glazing to all doors having lites, and as indicated on drawings. Provide glass to conditions indicated on drawings and to this Section, and at minimum.
  1. Ceramic glass: to all fire separation rated openings, to meet Ontario Building Code and NFPA 80 requirements and ULC or equivalent tests acceptable to the frame or door listing.
  2. Tempered glass: all interior and exterior doors and screens, except where rated in excess of 0 hour, in which case glass shall be ceramic glass.
  3. Provide glass thickness to a minimum as indicated. Where no thickness is indicated, provide 6 mm glass. Where glass must be thicker to ensure performance to referenced standards, to withstand nominated design loads, and where required by authorities having jurisdiction, provide such thicknesses as required to meet this performance. Note that where glass must perform the function of guard to meet OBC provisions for forces, this Contract requires that thicker glass be provided at no further cost to meet such performance in locations where glass forms the guard under the OBC.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division One, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.

### 2. Related Requirements

1. The Contractor is specifically cautioned that the Work requires achievement of the performance objectives for building systems described in Section 019010 and this Section. The Contractor shall organise the provision of the components of building systems to achieve the intent of the building system design, and shall provide all products and execution reasonably inferable as necessary to achieve the performance objective.
2. The Contractor shall perform the installation work to meet performance requirements for anticipated service life of the assemblies and shall provide the design of connections and fasteners as set out in Section 017010.
3. The Contractor shall thoroughly review all Sections of the specifications, and all drawings, to ensure that the requirements for execution of complete and functioning Interior Finishing Systems throughout the Work.
4. In general, interior finishing systems consist of the following components:
  1. coating systems, to interior surfaces, to form cured finishes to those substrates;
  2. applied finishes to substrates, such as carpet, tile, resilient flooring, or similar finishes;
  3. suspended ceiling systems in wallboard or as lay-in panels;
  4. Support elements and connections to the building structural system; and
  5. connections to adjacent systems.
5. Requirements for the components of the interior finishing system are additionally described in the following sections:

1. Indoor Air Quality Requirements	Section 018080
2. Rough Carpentry Substrates and Support for Finishes	Section 061000
3. Finish Carpentry	Section 062000
4. Architectural Woodwork	Section 064000
5. Solid Surface Fabrications	Section 066100
6. Fire-stopping	Section 078400
7. Joint Protection	Section 079000
8. Steel Doors and Frames	Section 081113
9. Hardware to Openings	Section 087000
10. Glazing to Openings and Misc. Glazing	Section 088000
11. Non-Loadbearing Studs and Boardwork	Section 092000
12. Acoustical Ceiling Tile Systems	Section 095100
13. Resilient Flooring	Section 096500
14. Painting and Coating	Section 099000
15. Interior Building Signs	Section 101400
16. Wall and Corner Guards	Section 102600
17. Washroom Accessories	Section 102800
18. Installation of Owner-supplied Equipment	Section 110500
19. Window Shades	Section 125000
20. Window Films	Section 125250
21. Mechanical Devices Visible in the Finished Work	see Mech. Docs.
22. Electrical Devices Visible in the Finished Work	see Elec. Docs.

6. The following related systems and components of related systems provide inputs to and receive outputs from the Interior Finishing System. They are described elsewhere as noted:

1. Building Structural System, providing structural support Section 019550
7. The Interior Finishing System indirectly affects the following systems described elsewhere:
  1. Fire Separation System Section 019522
  2. Barrier-Free Path of Travel System Section 019530
3. Definitions
  1. *Interior Finishing System* is hereby defined as an interrelated set of assemblies of materials, components, and Products that are exposed to the indoor environment or ground, or that are separating spaces (or spaces and the ground) that create the finished environment for use of spaces. The performance requirements for components of the system may include (depending upon component) specific requirements for visual appearance, slip resistance, resistance to cleaning and maintenance practices, gloss and reflectivity, off-gassing in early facility life, expansion and contraction in response to environmental conditions, sound absorption, longterm wear and abuse-resistance characteristics.
4. System and Performance Intent
  1. The intent of the Interior Finishing System is to achieve a co-ordinated set of finished surfaces that can support and respond to the use of the interior spaces over the life of the publicly used and intensively used building, without undue wear or deterioration, with resistance to this normal use, and that has the ability to be properly cleaned and maintained without degradation.
  2. The Interior Finishing Systems may include the following, either singly or in combination:
    1. Ceiling Assemblies
    2. Flooring and Floor Coatings
    3. Finished Wall Surfaces
    4. Millwork and built-in items
    5. Portions of the Exterior Envelope System that form interior finishes (e.g. windows)
    6. Accessories and Equipment
    7. Hardware, Equipment and Signs
    8. Finished surfaces of exposed Mechanical and Electrical devices
  3. The existing and new facility has several areas of differing use that require components of the Interior Finishes System to withstand different levels of normal use and even potential abuse:
    1. entry areas undergoing changes of temperature and heavy user traffic;
    2. clinic interior areas subject to use that may involve spills of bodily fluids and abuse;
    3. office work environments;
    4. washroom areas potentially subject to abuse and vandalism.
5. Pre-Installation Conferences – N/A this project
  1. Schedule during initial phases of project start-up a meeting with the Consultant to review and consider the means and methods proposed by the Contractor for installation of the systems, and to ensure that the location, intent, and requirements of the systems are clearly understood by the Contractor and Trade Contractors who will perform the work related to this system.
6. Sequencing
  1. Plan and sequence work to permit installation of materials in conjunction with related materials so that the performance intent of the systems is achieved. Trades shall strictly conform to sequencing requirements for Interior Finishing Systems. Such requirements shall have primary precedence over all other construction sequences.

7. Submittals

1. Submit in accordance with Division 1 requirements and:
  1. Acknowledgement to Consultant's satisfaction of review of submittals of other systems as they relate to this system.
  2. Submit lists of brands and product cut sheets showing conformance to specification standards for system components prior to confirming material orders.

8. Co-ordination

1. The construction superintendent shall review submittals of this and other work to ensure full understanding of the interrelation of components that will achieve the performance of the Interior Finishing Systems.
2. Inspection work and co-ordination work required to achieve the requirements of this Section are the responsibility of the Contractor's site superintendent and shall not be assigned to a trade contractor even if portions of the material installation work are so assigned.

9. Reference Standards and Codes

1. Ontario Building Code requirements for Resource Conservation and Environmental Separation.

10. Quality Control

1. All finishes shall be installed, lapped, and joined to one another with due regard for their performance under variations in temperature and humidity. Finishes must be installed so as to conceal methods of fastening and to lap finishes for best performance where water may run across or down finish surfaces, and to form finish surfaces free of fasteners except where explicitly noted.
2. Joints between finishes shall be caulked with sealant or otherwise made tight and impervious to water and cleaning operations.

11. Temporary Facilities, Safety Requirements and Environmental Protection

1. Conform and cooperate to ensure requirements for temporary facilities, safety, cleaning and waste management, and environment as set out in Section 016010 and Division 1 are achieved throughout the course of the Work. Provide an appropriate Interior Finishing System for the personnel performing work of this Contract, where required to ensure the safety of such personnel and building occupants.

12. Warranties

1. Notwithstanding warranty requirements of system products or components of the Interior Finishing System, the Contractor shall warrant the work and installations of the interior finishes in accordance with GC 12.3.1 and 12.3.4 for all connections between and among differing finish components.

13. Commissioning

1. Perform commissioning requirements in accordance with Division 1 requirements to ensure the proper function of components of the system, and the system.

14. Building Systems Requirements

1. In addition to the Fire Separation and Barrier-Free Path of Travel Systems, the work described by this Section is related to the other Building Systems as defined in Section 019010 and discussed elsewhere in this Section.

2. The Interior Finish System and its components shall be supported to the Building Structural System such that the support is permanent and incorporates all anticipated movement of the Structural System under live loads and occupancy conditions
3. Comply with requirements for performance, review, and co-ordination of such relations as set out in Division 1.

## **2. PRODUCTS AND EXECUTION**

### **1. General**

1. Products and Execution requirements for components of the Interior Finishing System are described in related sections and divisions of the specification, in schedules, and on drawings.
2. Execute work as described herein and to achieve performance.
3. Co-ordinate work described elsewhere in the Contract to ensure complete and continuous systems to achieve Ontario Building Code objectives for finishes and to achieve design intent for maintenance and longevity of finishes during normal use for which the spaces of the building are intended. Where sequencing of construction to achieve this goal requires multiple visits, partial installations, and integrated installations, then sequence and perform the Work as necessary with multiple trades working in close co-ordination.

### **2. Examination**

1. Examine supports, substrates and work to other building systems to ensure conditions are satisfactory to achieve the performance standards for the work of this Section.
2. Commencement of the work shall imply acceptance of conditions.
3. Schedule installation of components in strict accordance with sequencing requirements to achieve performance and continuity of finishes behind finish components of other systems.

### **3. Installation of Components**

1. Requirements for installation of products that form components of Interior Finishing Systems are described in related sections of the specification, in schedules, and on drawings.
2. Sequence the installation of systems and components for best finished appearance and durability, using concealed fastening and affixing methods.
3. Do not install finish devices of building systems until all surface finish systems are installed. Ensure devices are adjustable and fit smoothly and securely to substrate finishes. Where profiles of substrates are curved, provide intermediate trim fill to acceptance of Consultant in each case. Pay all costs for intermediate trim to join flat device surfaces to curved substrate finish surfaces.
4. Provide accessories and device trim colours and finishes to selection of Consultant. Note that device colours may vary throughout the work such that several colours or finishes are required, at no further cost to the Owner.
5. Provide changes in colour and finish between adjacent surfaces in the finished work, with all transition trim necessary for smooth and neat transition.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division One, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.

### 2. Related Requirements

- |  |                           |
|--|---------------------------|
| 1. Work Related to Existing                  | Section 011030            |
| 2. Indoor Air Quality Requirements           | Section 018080            |
| 3. Emergency Egress System                   | Section 019521            |
| 4. Rough Carpentry                           | Section 061000            |
| 5. Finish Carpentry                          | Section 062000            |
| 6. Architectural Woodwork                    | Section 064000            |
| 7. Solid Surface Fabrications                | Section 066100            |
| 8. Fire Stopping                             | Section 078400            |
| 9. Joint Protection                          | Section 079000            |
| 10. Steel Doors and Frames                   | Section 081113            |
| 11. Glazing to Openings                      | Section 088000            |
| 12. Interior Finishing Systems               | Section 090500            |
| 13. Acoustical Ceiling Tile Systems          | Section 095100            |
| 14. Resilient Flooring & Wall Bases          | Section 096500            |
| 15. Painting and Coating                     | Section 099000            |
| 16. Specialties                              | Division 10               |
| 17. Owner Supplied Equipment                 | Section 110500            |
| 18. Access Doors                             | Divisions 20 and 26       |
| 19. Mechanical Systems (Grilles & Diffusers) | Division 20 & Mech. Docs. |
| 20. Electrical Systems (Lighting, Security)  | Division 26 & Elec. Docs. |

### 3. Definitions

1. The term *wallboard* where used in the Documents may refer to gypsum wall board (GWB) of industry standard density for interior use, cement board, tile-backer board, gypsum sheathing board (such as GP Densglass exterior sheathing or other sheathings), abuse-resistant gypsum wall board, water-resistant wall board or other panel product as the case and the specification may require. The Contract requires and includes that wallboard be selected in accordance with the partition, wall, and ceiling requirements as well as the finishes that will be applied to the panel products and the end use of the adjacent areas and environments.

### 4. Work Described by this Section

1. This Section describes working methods and standards of workmanship that must be provided in the application and installation of framing and panel products forming walls, partitions, ceilings, bulkheads and interior soffits, and similar elements in the Work.
2. **The work of the Contract includes all wallboard, as well as supplementary furring and non-loadbearing framing necessary to support wallboard materials. Such furring and framing is not shown on drawings. The Contractor shall supply all such furring and framing as necessary to support the panel material at maximum 16" (400 mm) on centre for partitions and walls (unless specifically otherwise noted), and at maximum 24" (600mm) on centre for ceilings and soffits. No further costs will be accepted by the Owner for products and installation required by this standard. Where framing members described in other sections form the support for panel work, supply and install appropriate supplementary framing to meet the spacing and support requirements set out herein.**
3. Where support framing is specifically detailed, provide such framing and further framing as necessary to meet this specification. Not all required framing members, bracing, furring, and work are shown on drawings.

5. Reference Standards
  1. Comply with requirements of CAN/CSA-A82.31-M91.
  2. CAN/CGSB-71.25-M88, Adhesive, for Bonding to Framing and Metal Studs.
  3. CAN/ULC-S102-10, Building Materials and Assemblies, Standard Method of Test for Surface Burning Characteristics of Materials.
  4. ASTM A 653M-15e1, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  5. ASTM C 1047-09, Accessories for Wallboard and Veneer.
6. Quality Assurance
  1. Work of this section must be performed by experienced drywall acoustic and lathing applicators or drywall finishers and plasterers having a minimum of 2 (two) years experience in this type of work, and by a dedicated separate trade contracting firm with a ratio of experienced finishers to apprentices acceptable to the Consultant. Submit proof of qualification upon request. General labour forces of the Contractor may only perform work of this section if they have certificates of qualification as applicators.
7. Basic Product Requirements
  1. Handle board and panel products to prevent damaged and broken edges.
  2. Store materials in dry place so as to preserve their quality and fitness for work.
  3. Fire Protection Requirements: The work of this Contract includes rated floor, ceiling and wall assemblies that are to be constructed in accordance with ULC and OBC requirements for such assemblies.
6. Basic Execution Requirements
  1. Maintain temperature minimum 10°C, maximum 21°C for 48 hours prior to and during application of gypsum boards and joint treatment, and for at least 48 hours after completion of joint treatment.
  2. Apply board and joint treatment to dry, frost free surfaces.
  3. Ensure that work to be concealed by gypsum board has been installed, tested, inspected and accepted before starting covering work.
  4. Ventilate building spaces as required to remove excess moisture that would prevent drying of joint treatment material immediately after its application.
7. Warranties
  1. In accordance with Division 1 requirements and GC12.3.1 and 12.3.4 as amended.
8. Identification of Building Systems
  1. The work described by this Section forms components in the following Building Systems as defined in Section 019010. Comply with requirements for the integration of the work described in this Section into its roles in the various systems. Provide the work so that the performance requirements of the overall system of which it forms part is achieved. Trade contractors shall not proceed in uncertainty regarding the role or requirement of the component in relation to the system. Obtain clarification from the Contractor and the Trade Contractor responsible for the system, as set out in Section 019010:

1. Emergency Egress System, to provide components of that system, as per Section 019521;
2. Fire Separation System, to provide components of that system, as per Section 019522;
3. The Barrier-Free Path of Travel System, to provide supports for devices of that System;
4. Interior Finishes System, to provide components of that system, as described in Division 09 and in related Systems forming part of finish systems.

## 2. PRODUCTS

### 1. Framing, Furring and Trim

1. Unless otherwise specified, provide framing members of minimum 0.5 mm core thickness steel hot dip galvanized (wipe coat) to ASTM A563M-e1.
2. Studs, interior locations: channel shaped screw-on type: depth as indicated; with knurled supporting flanges at least 34 mm wide; with service pass-through holes at 610 mm o.c. in web. Provide minimum 0.9 mm thick studs where stud depth exceeds 92 mm.
3. Metal furring runners, hangers, tie wires, inserts, anchors: to CSA A82.30, galvanized.
4. Drywall furring channels: 0.5 mm core thickness galvanized steel channels for screw attachment of gypsum board.
5. Top and bottom runners: channel sections, 35 mm legs and service pass-through holes at 610 mm o.c. Depth to suit studs.
6. Rough framing members: 38 x 13 x 1.2 mm and 19 x 13 x 1.2 mm galvanized steel channels.
7. Furring and strapping members to receive gypsum board: 19 mm deep channel shaped section with outstanding flanges and 35 mm wide knurled supporting face.
8. Corner beads: beaded angle with perforated flanges.
9. Casing beads: channel shaped; beaded corners.
10. Hangers: minimum 3 mm galvanized steel wire.
11. Tie wire: minimum 1.5 mm soft annealed galvanized steel.
12. Metal control joint section: bellows shaped section with perforated flanges.
13. Reveal mouldings: extruded aluminum, profiles as indicated, by Fry, Pittcon or Gordon.

### 2. Board Material ("wallboard")

1. Minimum Standard for this Contract:
  1. **Board forming the base standard for this Contract and use throughout the Work is CertainTeed "Extreme Impact" Impact Resistant gypsum wallboard to ASTM C1629, 5/8" thick, nominal 4' wide by maximum practical length, ends square cut, edges bevelled.**
  2. Do not use regular board for the vertical surfaces of partitions unless for bulkheads located above 8'-0" (2,440mm) from finished floor.
  3. Use specifically indicated board for Type X (GWB) for ULC and fire-resistive assemblies only where impact-resistant is not required to partitions. Where accepted that board need not be impact-resistant, it shall be: to ASTM C 36 16 mm, regular and Type 'X', nominal 4'-0" (1,200mm) wide by maximum practical length, ends square cut, edges bevelled. Use of 1/2" (13 mm) for other than locations specifically identified in drawings and schedules is not permitted.

2. Abuse resistant board: standard board for partitions and wallboard within 2400 mm of finished floor shall be G-P Gypsum DensArmour Plus 16 mm Abuse-Resistant Interior Panel and Type 'X' where board is scheduled or indicated for gypsum wallboard. CertainTeed "Extreme Abuse", 16mm thickness, is acceptable equivalent. Where this product is proposed as an alternative for use as Type 'X' board in rated assemblies, it must additionally meet the requirements outlined in Section 019522 and tested for use in the ULC assemblies referenced in the Documents.
  3. Water-resistant exterior sheathing board and roof underlay board: GP DensGlass Gold exterior sheathing, 13mm water resistant sheathing for exterior use, and where scheduled or indicated for interior use. CertainTeed GlasRoc Exterior Sheathing" is an acceptable equivalent. Where this product is proposed for use as roof underlay board it must be accepted by the Roofing Trade Contractor performing the Work of Section 075200 and meet performance requirements for Thermal Barrier Underlay Board identified in Section 075200.
  4. Tile backer board: GP DensShield Fibreguard Tilebacker, 5/8" (16mm) water resistant, treated, mold resistant interior panel for wet areas, to all washrooms up to level of ceramic wall tile finishes, and where indicated for "tilebacker". CertainTeed "Diamond back Tilebacker" is acceptable equivalent.
  5. Cement board: CGC Durock Next Gen cement board, for locations where board is scheduled or indicated for "cement board", and as substrate to manufacturer masonry veneer. CertainTeed "Permabase Cement board by National Gypsum" shall be acceptable equivalent.
3. Fastening and Finishing Materials
1. Resilient clips, drywall furring: 0.5 mm base steel thickness galvanized steel for resilient attachment of panel where requested on documents.
  2. Nails: to ASTM C 514-04 (2014).
  3. Fasteners shall be as recommended by panel manufacturers, and further as required for the particular substrate and framing condition. Fasteners to exterior and cement board in particular shall be cadmium and ceramic coated respectively.
  4. Laminating compound: as recommended by board manufacturer for specific board and substrate, asbestos-free.
  5. Casing beads, corner beads, control joints and edge trim: to ASTM C 1047-14a, zinc-coated by electrolytic process, 0.5 mm base thickness, perforated flanges, one piece length per location. Note that transitions to lay-in panel ceiling grid systems at edge of bulkheads require (where height of bead and ceiling system align) a combination finishing bead and suspension system edge that is specified in Section 095100.
  6. Sealants: to Section 079000, of single manufacture throughout the Work.
  7. Taping materials: Paper tapes shall be used for base gwb panel work, but mesh tape shall be used for abuse-resistant, water-resistant, and exterior sheathing applications. Mesh tapes require the use of specific joint compound.
  8. Joint compound: to ASTM C 475-15, asbestos-free, water resistant as recommended by board manufacturer for specific conditions of service, CGC or equivalent manufacture, and as follows:
    1. all-purpose, for taping and first coats;
    2. lightweight all-purpose, for second and finishing coats;
    2. quick-setting "hot" mix setting type compound for filling of larger joints, and for abuse-resistant, water-resistant, and exterior sheathing applications for taping and first coats;
    4. Mapei Plani-patch or similar cement-based leveling compound for cement board.

9. Bugle headed, ceramic, cadmium and coated fasteners, or as recommended by GP to be compatible with board material and substrate for the specific purpose. Upon request, submit written manufacturer's recommendations for the specific condition and materials.
4. Acoustical Materials
  1. Acoustic Sealants: in strict accordance with requirements of Section 079000.
  2. Acoustic Batt Insulation: Roxul Safe n Sound or equivalent, sized to fill cavity for 90 mm stud depths and 75 nominal thickness for 152 stud depths, unless otherwise noted.
5. Reglets and Panel Trim:
  1. Provide galvanised steel edge bead and half-bead to all panel edges at reveals and reglets, to suit profiles.

### 3. EXECUTION

1. Metal Framing
  1. General:
    1. Framing and furring indicated on drawings is schematic and shall not be considered exact or complete. Location and spacing of members, bracing, supports and securement shall be in accord with referenced standards as required to provide complete and finished work, and is included in the Work and Contract Price.
    2. Make provision for supporting recessed and surface mounted fixtures and equipment. Provide additional framing, supports and stiffeners as required, and at openings using wood studs, plywood, and other blocking necessary for the rigidity of the installation throughout anticipated conditions of service in the completed Work.
    3. Neatly frame around recessed fixtures and openings.
    4. Examine mechanical and electrical drawings and co-ordinate with Mechanical and Electrical Divisions to determine openings required.
  2. Framing of Partitions (where not wood framed or framed with loadbearing light gauge steel framing as per Assembly Types):
    1. The trade contractor performing partition framing work is specifically cautioned that partitions require construction to capture and transfer structural loads imposed upon them, for distribution vertically and/or horizontally along the partitions to the structural system of building. Unless specified or shown otherwise, extend steel studs to underside of structural slab or deck above to supporting framing as detailed. Brace tops of all partitions against lateral loads.
    2. All steel studs shall be spaced at 400 mm maximum, except where indicated otherwise.
    3. Install runner channels at top and bottom of partition and secure to supporting building elements at maximum 610 mm o.c.
    4. At partition corners extend one runner channel to end of corner and butt other runner channel, allow clearance for gypsum board thickness; do not mitre runner channels.
    5. Install steel studs vertically; fix studs to runner channels by crimping or screwing on both sides of stud.

6. Install additional studs as detailed and required at partition intersections, openings and terminations at dissimilar materials. Place studs no more than 50 mm from abutting walls, openings and each side of corners. Provide double stud at door jambs.
  7. Stiffen partitions over 3.5 m in height at mid-height with at least one 19 mm horizontal bracing channel extending full length of partition.
  8. Provide slip joint at top of partitions to accommodate deflection of structure without casing damage to partition.
3. Ceilings and Soffits:
1. Erect suspension and furring system level with a maximum tolerance of  $\pm 3$  mm over a 3000 mm length. Use larger support members where detailed. Take note of details and structural system requirements and locations of recessed electrical.
  2. Suspension system shall support ceiling assemblies, with maximum deflection of  $L/360$ ,  $L$  being span between supports.
  3. Hangers for suspended ceilings shall support grillage independent of walls, columns, pipe and ducts. Space hangers at maximum 1220 mm o.c. along rough furring members and not more than 150 mm from ends. Do not place hangers in front of access panels.
  4. Space rough furring members at maximum 915 mm and not more than 150 mm from perimeter walls.
  5. Space furring channels transverse to runner channels at maximum 6210 mm o.c. except at exterior soffits, and secure to each support with clip or saddle tie with 2 loops of tie wire. Install furring channels so as not to contact perimeter walls.
  6. Where ductwork, piping and other elements within ceiling spaces interfere with direction suspension of ceiling from structure, install additional framing securely fastening to main structure to accommodate proper hanging of ceiling.
4. Bulkheads, Coves, Furring
1. Frame to profiles shown, rigid, square, true to line and securely fastened to supporting building elements.
  2. Space furring members to receive gypsum board at maximum 610 mm o.c.
  3. Provide rough framing and bracing members as required to ensure stability and accuracy of work.
  4. Where indicated, provide resilient furring channels, spaced at maximum 600 mm o.c.
2. Furring and Final Preparation of Framing for Panels
1. Install work level to tolerance of 1:1200 and to written instructions of panel manufacturer for specific application and conditions of service.
  2. Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers, and grilles.
  3. Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.
  4. Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.

5. Install wall furring for gypsum board wall finishes in accordance with ASTM C 840, except where specified otherwise.
  6. Furr openings and around built-in equipment, cabinets, and access panels on four sides. Extend furring into reveals. Check clearances with equipment suppliers.
  7. Furr duct shafts, beams, columns, pipes and exposed services where indicated.
  8. Erect drywall resilient furring transversely across studs, spaced maximum 600 mm oc and not more than 150 mm from ceiling / wall juncture to all assemblies where specified. Secure to each support.
3. Board Preparations
1. Do not apply panel materials until bucks, anchors, blocking, vapour retarder, electrical and mechanical work are accepted.
  2. Apply single and double layers as required to framing using manufacturer recommended fasteners. Maximum spacing of fasteners shall be 300 mm oc. along each framing support member, and more frequently where required by manufacturer.
  3. Provide edge bead and reglet joint continuously around periphery of each face of partitioning to seal panel/structure junction where partitions abut exterior wall masonry. Seal full perimeter of cut-outs around electrical boxes, and ducts in partitions where perimeter is sealed with sealant and where partitions are in wet areas.
  4. Do not install exterior sheathing boards until all structural framing including structural steel and loadbearing steel stud construction has been inspected and accepted by authorities, inspection and testing firms, Contractor's steel stud review engineer, and accepted by Consultant.
4. Installation of Boards
1. Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges. Secure at 150 mm o.c. using contact adhesive for full length.
  2. Construct control joints of preformed units and support independently on both sides of joint.
  3. Provide continuous polyethylene dust barrier behind and across control joints.
  4. Locate control joints where indicated, at all changes in substrate construction, at approximate 10 m spacing on long corridor runs, and at approximate 15 m spacing on ceilings. Confirm locations with Consultant. All such joints are included in the Contract and Contract Price, regardless of whether indicated on drawings or not.
  5. Install control joints straight and true.
  6. Construct expansion joints as detailed, at building expansion and construction joints. Provide continuous dust barrier.
  7. Install expansion joints straight and true.
  8. Splice corners and intersections together and secure to each member with 3 screws.
  9. Install access doors to electrical and mechanical fixtures specified in respective Sections.
  10. Rigidly secure frames to furring or framing systems.
  11. Finish face panel joints and internal angles with trim system installed according to manufacturer's directions.

12. Install reglets, edge bead, corner trim, control joints and other accessory trim as required with bull bed of sealant.
5. Moisture and Acoustic Control and Sealant Work
  1. Provide sealant caulking at all panel edges each side as follows:
    1. At perimeter of partitions.
    2. Around objects penetrating partitions.
  2. Caulk around objects such as electrical outlets, light switches, electrical and mechanical panels and boxes, grilles, and other objects penetrating. Caulk behind metal control joint sections.
6. Door Frames, Screens, Access Doors, Louvres, Vents, and Grilles
  1. Install access doors supplied by Divisions 20 to 30 inclusive. Build doors into panel elements flush and parallel to walls and securely fastened. Position frames to relationships with panel material to acceptance of Consultant. Do not proceed in uncertainty.
  2. Co-ordinate framing installation of steel door frames occurring in gypsum board partitions. Follow installation requirements specified in Section 081113.
7. Jointing and Compound Work
  1. Deep filling shall be done with quick setting compound, 45 minute or quicker type.
  2. Provide taping to all joints in first bed of joint compound, using type of compound specific to the board and tape. Use pre-mixed compounds for first coats only for base GWB wallboard installations, and use lightweight compound only for second and finish coats. Use site mix quick setting compounds for abuse-resistant, water-resistant and exterior sheathing board application taping and first coats.
  2. Provide min. of 2 coat compound applications and further coats as required to achieve smooth level surfaces. Sand after coats, to provide smooth and complete partition, ceiling and soffit profiles for finishing. Do not over-sand boards.
  3. Surfaces to receive wall coverings shall be finished to standard necessary for wall covering installation.
  4. Abuse-resistant, cement board, and water-resistant wallboard installations require quick setting "hot mud".
  5. Water-resistant board applications require the use of reinforced fibreglass mesh tape, not paper tape.
  6. Tilebacker board applications shall be taped ready for the work described in Section 093100 with taping products recommended by the tilebacker board manufacturer for the specific application.
8. Fire Rated Assemblies
  1. Construct fire-rated assemblies where indicated to applicable ULC and OBC Supplementary Standard designs to achieve required ratings.
  2. All wall board partitions require firestop sealant at perimeter where the assembly joins other material assemblies.
  3. Provide furring, studwork, board, beads and trims necessary for the work of firestopping and to achieve ratings.

9. Reglets, Trims, and other Built-in Work

1. Build in work supplied by other Sections and all reglets, trim, and reveals shown on drawings.
2. Co-operate with rough and finish carpentry work, and architectural woodwork trade contractors to ensure blocking is installed and co-ordinated to all locations requiring such support, prior to installation of boardwork.
3. Co-ordinate sleeving and holing requirements and support requirements for mechanical and electrical devices and associated sealant work, firestopping work, and finishes work to such elements.

10. Sealant Work

1. Supply and install sealants in accordance with the requirements of Section 079000.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.

### 2. Related Requirements

- |  |                  |
|--|------------------|
| 1. Work Related to Existing Building   | Section 011030   |
| 2. Building Structural System          | Section 019550   |
| 3. Rough Carpentry                     | Section 061000   |
| 4. Finish Carpentry                    | Section 062000   |
| 5. Interior Finishing System           | Section 090500   |
| 6. Non-loadbearing Studs and Boardwork | Section 092000   |
| 7. Paintings and Coatings              | Section 099000   |
| 8. Mechanical fixtures and trim        | Mechanical Docs. |
| 9. Electrical fixtures and trim        | Electrical Docs. |

### 3. Construction Schedule

1. Perform work to the sequence of construction, and the approved construction schedule, to meet the schedule milestones and interim milestones as an integral part of the work of this section.

### 4. Submittals

1. Submit in accordance with Division 1 requirements:
  1. Product data for all Products this Section.
  2. Samples of each type of acoustic panel and suspension system.

### 4. Co-ordination

1. Co-ordinate with Mechanical & Electrical for work to be built into the work of this Section.
2. Do not install acoustic ceilings until all rough-in work, including cabling for telecommunications and security systems, is completed.

### 5. Reference Standards and Codes

1. Fire-resistance rated floor/ceiling and roof/ceiling assembly: certified by a Canadian Certification Organization accredited by Standards Council of Canada.

### 6. Quality Control

1. Comply with applicable requirements of ASTM C636M-13. Maximum deflection: 1/360th of span to ASTM C635M-13a deflection test.

### 7. Basic Product Requirements

1. Store materials in work area 48 (forty-eight) hours prior to installation.

### 8. Basic Execution Requirements

1. Ensure that work to be concealed by acoustic ceilings has been installed, tested, inspected and accepted before starting work.

### 9. Maintenance Manuals and Materials

1. In accordance with Division 1 requirements and GC12.3.1 and 12.3.4, and further:

2. The Contractor and the Trade Contractor performing the work of this Section shall warrant the support and fastening of all components of ceiling grids and panels in accordance with GC12.3.1 and 12.3.4 but for three (3) years. All ceiling systems shall be tested for adequacy of support and fastenings with random commissioning test prior to final acceptance of the Work. Design and provide work to withstand minor movement of the grid without failure of tile support. All tiles lacking adequate support on all four sides shall be replaced.

#### 10. Warranties

1. In accordance with Division 1 requirements and GC12.3.1 and 12.3.4, and further: warrant the support and fastening of all components of ceiling grids and panels for three (3) years.

#### 11. Building Systems Requirements

1. The work described by this Section is a component of the Interior Finishes Building Systems. Comply with requirements for the integration of the work described in this Section into its roles in the various systems. Provide the work so that the performance requirements of the overall system of which it forms part is achieved.
2. The work described by this Section is related to the Building Structural System. The ceiling system installations must be supported from the Building Structural System and shall be braced to meet lateral forces anticipated by the structural design. Bracing is not shown within ceiling spaces, but is required.

## 2. PRODUCTS

1. Standard of acceptance is CGC, or equivalent by Armstrong, for best match to existing.
2. Suspension Systems: Donn DX/DXL 15/16" standard suspension system for 2 by 4 tiles and:
  1. Main tees: 42mm x 23.8mm bulb section, minimum 0.5mm thick cold rolled galvanized steel. Main tee members shall be 12'-0" (3,660mm) long.
  2. Cross tees: 23.8mm wide, minimum 0.5mm thick cold rolled galvanized steel. Main tee members shall be 3.6m long; profile designed to limit deflection to 1/360 of span; designed to have suitable detail to rest on, automatically engage, level and lock to main tee.
  3. Colour: flat white to areas receiving acoustic ceilings
  4. Moldings and Trims: 7/8" x 7/8" (22 x 22mm) by 12'-0" (3,660mm) nominal length exposed face pre-finished galvanised steel wall moldings, flat white.
  5. Hanger wire: galvanized steel wire, minimum 3.6mm diameter.
  6. Hanger inserts: purpose made. Screws, clips, bolts, inserts or other devices applicable to the indicated method of structural anchorage for ceiling hangers and whose suitability for use intended has proven through standard construction practices or by certified test data. Size devices for 3x calculated load supported except size direct pull-out concrete inserts for 5x calculated loads.
  7. Accessories: splices, clips, wire ties, retainers and wall moulding reveal, to complement suspension system components, as recommended by system manufacturer.
3. Acoustic Panels
  1. Except where otherwise indicated, acoustic panels shall be 2'-0" by 4'-0" (610mm by 1,220mm) CGC Eclipse 78775 3/4" (19mm) square edge, lay-in, non-directional, colour white, NRC 0.70, CAC 35.

2. Purpose-made for all Kitchen, Food-prep, Dish-wash and similar areas, as well as to corridors providing access to and from such areas, acoustic panels shall be USG Ceilings Kitchen Lay-in-Panel Climaplus Performance no.3410: anti-microbial on face and back panel, 2'-0" (610mm) by 4'-0" (1,220mm) by 5/8" (16mm) panel size, square edge, lay-in, non-directional, colour white, NRC 0.70, CAC 35.

### 3. EXECUTION

1. Examination, Scheduling, Supply Work, and Removals
  1. Do not install ceiling suspension system, acoustical panels and tiles until work above ceiling has been reviewed and accepted by the Consultant.
  2. Where structure or other exposed areas or ceiling areas are indicated or scheduled for paint finishes, do not install ceiling suspension system or any aspect of the system until completion and acceptance of painting work.
  3. Examine all partitions, walls, and other surfaces to which the ceiling system is adjacent, and report any defects in plumb, true, squareness, or other defect requiring correction prior to beginning the ceiling installation work.
  4. Supply ceiling planks to the trade contractor performing work of Section 098100, packaged new and without damage, in quantities suited to the requirements of that portion of the Work, including for reasonable waste and damage allowance.
  5. Remove existing lay-in ceiling systems where required. Co-operate with other trade contractors to support devices and components of Building Systems that are to remain for re-installation in new ceiling systems. Dispose of all removed items and pay all disposal costs.
2. Ceiling Layout
  1. Lay out ceilings to reflected ceiling plans and symmetrical within each area to obtain uniform borders. Where layout is not shown install as directed by Consultant.
  2. Finished work shall be plumb and square with adjoining work. The installation shall be level horizontal unless specifically shown for inclined installation. Use laser level methods throughout and examine all partitions and bulkheads for squareness and report any defects to Consultant.
  3. Co-ordinate ceiling grid layout with access requirements for mechanical and other equipment and devices in the ceiling area BEFORE mechanical equipment is roughed in.
3. Installation of Suspension Systems
  1. Installation shall be in accordance with ASTM C636 except where specified otherwise.
  2. Install suspension system to manufacturer's instructions and certification organizations tested design requirements.
  3. Secure hangers to overhead structure using attachment methods acceptable to Consultant.
  4. Install hangers spaced at maximum 4'-0" (1,220mm) centres and within 6" (150mm) from ends of main tees.
  5. Lay out according to reflected ceiling plan, from centre line of ceiling both ways, to provide balanced borders at perimeter with border units not less than 50% of standard unit width.
  6. Ensure suspension system is co-ordinated with location of related components.

7. Install wall moulding to provide correct ceiling height and to suit adjacent wall substrates. Where partitions or walls are scheduled or shown for wall coverings install wall coverings prior to wall moldings.
  8. Support at light fixtures and mechanical diffusers with additional ceiling suspension hangers within 6" (150mm) of each corner and at maximum 2'-0" (600mm) around perimeter of fixture.
  9. Interlock cross member to main runner to provide rigid assembly.
  10. Frame at openings for light fixtures, air diffusers.
  11. Finished system shall be square with adjoining walls and level within 1:1000 unless shown for inclined installation.
4. Installation of Panels
    1. Install panels in ceiling suspension system only after work within ceiling areas is complete, including mechanical system start-ups and verification of all components and systems present in the ceiling space.
    2. Distribute variations in colour and texture of panels to obtain uniform appearance.
    3. Install panels to form horizontal and level ceiling with all parts flush and joints butted tightly to hairline appearance.
5. Interface with Other Work
    1. Co-ordinate ceiling work to accommodate components of other sections, such as light fixtures, diffusers, and Owner's equipment, to be built into acoustical ceiling components.
6. Cleaning
    1. After installation, clean and touch up minor surface defects on panels.
    2. Clean all dust and debris from all surfaces, including suspension systems.
    3. Remove damaged and marked units and replace with new unmarked Products just before handover of the Work for Owner occupancy. Determination of damage and marking requiring replacement shall be at the Consultant's sole determination.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.
2. All Work to repair and make good existing substrates to receive new flooring Products, including new substrate materials and levelling, is included in the work of this Section and the Contract Price.
3. Where slab conditions for moisture do not fall within the accepted range as certified by written inspection by the flooring manufacturer rep, this Contract requires alternative measures and accelerations for installation of flooring on such slabs to written recommendations of resilient floor manufacturer in each case. Pay all costs for new requirements, adhesives, accelerated drying measures and similar to maintain required construction schedule.

### 2. Related Requirements

- |   |                            |
|---|----------------------------|
| 1. Work Related to Existing Building    | Section 011030             |
| 2. Indoor Air Quality Requirements      | Section 018080             |
| 3. Removals                             | Section 024119             |
| 4. Concrete                             | Division 03                |
| 5. Architectural Metal Fabrications     | Section 057000             |
| 6. Rough Carpentry                      | Section 061000             |
| 7. Finish Carpentry                     | Section 062000             |
| 8. Architectural Woodwork               | Section 064000             |
| 9. Sealants                             | Section 079000             |
| 10. Doors and Frames                    | Section 081113             |
| 11. Interior Finishes System            | Section 090500             |
| 12. Non-Loadbearing Studs and Boardwork | Section 092000             |
| 13. Painting and Coatings               | Section 099000             |
| 14. Existing Perimeter Radiators        | See Existing & Mech. Docs. |

### 3. Special Project Requirements

1. It is the intent of this section that all installation materials be low or zero V.O.C. and that materials will be installed according to the manufacturer's instructions.

### 4. Pre-Installation Requirements

1. Conduct pre-installation review of all substrates to verify conditions. Proceeding with installation of flooring materials shall constitute this Trade Contractor's acceptance of all substrate conditions as suitable for new flooring Work. Confirm direction of patterning and seaming with Consultant prior to installation.

### 5. Submittals

1. Submit in accordance with Division 1:
  1. Product Information for all Products this Section.
  2. Samples: Duplicate 12" by 12" (300mm by 300mm) sample of each type and colour flooring required; minimum 12" (300mm) long samples of wall bases and coves.
  3. Flooring manufacturer's installation manual containing acceptable substrate and environmental conditions.
  4. Upon Consultant or Owner request, Trade Contractor firm's qualifications, including but not limited to reference documentation, and evidence of experience.

5. Mock-up: For the purpose of evaluating the quality of workmanship, install a mock-up of the specified flooring following the manufacturer's installation recommendations. Obtain Owner's and Consultant's acceptance of workmanship standard. Mock-Up shall be performed to a single room, and shall include complete field installation, cove, and base. Upon acceptance of the mock-up, this installation shall be considered the standard of quality and basis of comparison for the balance of the project. The mock-up may remain in the finished work.
6. Reference Standards and Codes
  1. Manufacturers' written installation documentation; and
    1. ASTM F1482, Standard Guide to Wood Underlayment Products for Under Resilient Flooring.
    2. ASTM F1303, Standard Specification for Sheet Vinyl Floor Covering with Backing.
    3. NFPA 253 – Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source
    4. NFPA 258 – Test Method for Specific Optical Density of Smoke Generated by Solid Materials
    5. CAN/ULC S102.2 – Standard Test Method for Flame Spread Rating and Smoke Development of Flooring Materials.
    6. CAN/ULS S102 – Standard Test Method for Flame Spread Rating and Smoke Development of Wall Materials.
7. Quality Assurance
  1. Flooring Trade Contractor shall have demonstrated experienced in performing work of this section who has specialized in installation of work similar to that required for this project. All installers must have attended flooring installation training clinic or who has successfully installed flooring Products in three previous wet-area environments. Only in-house installers may be used.
8. Product Storage
  1. Store flooring materials in areas of application for at least 48 hours prior to installation.
9. Basic Product Requirements
  1. Handle, and store products in a manner to prevent damage, adulteration, deterioration, and soiling and in accordance with manufactures instruction where applicable.
  2. Store flooring in accordance with Suppliers instructions. Stand rolls up. Do not lay them down for any reason except to unroll at installation.
  3. Immediately remove and replace damaged or rejected materials from the work site at own expense and to the satisfaction of the Consultant.
10. Basic Execution Requirements
  1. Install products in accordance with the procedures for scheduling the Work as described elsewhere in Division 1. Install products in a timely manner so as not to impede the progress of the Work.
  2. Maintain minimum 21°C air temperature at flooring installation area for 3 days prior to, during and for 24 hours after installation.
  3. Substrates must have moisture readings within acceptable levels, as stated in written instructions by the floor material manufacturer. The flooring trade contractor shall test all surfaces until appropriate conditions are reached. Where schedule requires, Contractor shall provide temporary dehumidification at his own expense.
  4. Areas to receive resilient flooring shall be clean, fully enclosed, weathertight, and with a maintained temperature of 18°C to 29°C for 72 hours before, during and after the installation is completed. The flooring material and adhesives shall be conditioned in the same manner. A minimum temperature of 13°C must be maintained after installation.

5. Protect installed flooring against damage with heavy paper or plastic coverings. Do not place static loads on newly installed flooring until minimum 10 days after installation.
  6. Maintain protective coverings on all main halls until reviews for Substantial Performance.
11. Maintenance Manuals and Materials
1. Submit Maintenance instructions with recommended maintenance methods and procedures, for all floor materials, for inclusion into maintenance manual. Provide extra 2% of sheet flooring, each colour in one piece, from same production run as installed materials. Obtain receipt from Owner's representative of delivery of material. Overage and small pieces do not qualify as maintenance material.
12. Warranty
1. In accordance with Division 1 requirements and GC12.3.1 and 12.3.4, and further:
    1. At no cost to Owner remedy any defects in work of this Section due to defects in materials and workmanship provided under this Section for a period equivalent to the manufacturer's standard material warranty from date of Substantial Performance, in accordance with GC12.3.1 and 12.3.4 as amended in this Section. This warranty is in addition to the material warranty under GC12.3.6, which shall additionally be provided by the Product manufacturer.
    2. Failure of seams, abnormal fading, de-lamination, unravelling, stretching, wrinkling, visible loss of surface pile and any other conditions detrimental to appearance or performance shall be deemed defects under the warranty provisions.
13. Building Systems Requirements
1. The work described by this Section is a component of the Barrier-Free Path of Travel System and the Interior Finishes Building Systems. Comply with requirements for the integration of the work described in this Section into its roles in the various systems. Provide the work so that the performance requirements of the overall system of which it forms part is achieved.

## 2. PRODUCTS

1. Luxury Vinyl (LVT or LVP) Flooring
  1. LVT-1 to Shelter (Sleeping) Rooms and where indicated on Floor Finishes Plans: Tarkett iD Lattitude Wood Series, to Owner selection from quick ship standard colours.
  2. LVT-2 to Corridors and where indicated on Floor Finishes Plans: Tarkett iD Lattitude Wood Series, to Owner selection from quick ship standard colours, and for contrasting finish to LVT-1 above.
2. Sheet Vinyl Flooring (SV)
  1. SV-1 shall be Tarkett iQ Granit Safe.T homogeneous sheet flooring, colour no.21153 513 "Clay c/w integral coves. Welding Rod to manufacturer's colour recommendations.
  2. Trim colour to top of integral coves shall be to Consultant's selection. Sealant to top of coves shall be installed by this Trade Contractor, colour of sealants to Consultant's selection.
3. Vinyl Base Cove (VBC)
  1. Johnsonite Vinyl Wall Base, Traditional profile, 6" (150mm) high, colour to Consultant selection. Minimum 3,000mm lengths and 1/8" (3mm) thick, with grooved back. Acceptable Manufacturers include Roppe Corporation Pinnacle Rubber Standard Toe Base. Different colours shall be selected by Consultant for each condition with adjacent flooring, and to each floor level.

4. Rubber Stair Systems

1. Rubber Stair Landing (RSL) Tiles, to all stair landings: Tarkett, nominal 24" by 24" (600mm by 600mm) with rice paper texture, colour to Consultant Selection.
2. Rubber Stair Treads (RST): Tarkett, hammered texture c/w colour contrast nosing strip and integral contrast grit tape colour.
3. Rubber Stair Risers (RSR): Tarkett, to full width of stairs, to full height of risers to u/s of tread nosings, colour to Consultant selection. Colours may be selected to contrast with rubber stair treads, and to each stair location.
4. Rubber Base Cove (RBC): To perimeter of all areas receiving rubber stair landing tiles, except at locations of raised stringer construction or historic wood baseboard trims: Johnsonite Traditional Wall Base 6" (150mm) high, colour to Consultant Selections for each condition with adjacent flooring. Minimum 1,200mm lengths and 3mm thick, with grooved back. Acceptable Manufacturers include Johnsonite Rubber Wall Base, and Roppe Corporation Pinnacle Rubber Standard Toe Base.

5. Tactile Hazard Warning Indicators

1. Kinesk Engineered Products, Eon® Tile, 12"×12" polymer modified, tactile hazard indicators with 1/8" (3mm) truncated dome, colour "Vogue Black" for visual contrast with stair and landing finishes, or equivalent. Provide tiles for full width of stairs in increments of 12" (300mm).
2. Provide tactile hazard warning indicators to the tops of all stair flights and top of ramps.
6. Primers, fillers and adhesives: in strict conformance with manufacturer's written recommendations for Product to be installed and specific substrate.
7. Cementitious underlayment: Polymer modified quick setting cement based, as recommended by the floor manufacturer. Standard is Mapei Plani-patch. Gypsum based products are not acceptable.
8. Cleaning and finishing materials: in strict conformance with recommendations of the flooring material manufacturer.
9. Transition accessories shall be Tarkett or Johnsonite or Schluter or equivalent product as accepted by Consultant. Accessories shall be metal, not vinyl or rubber, unless specifically accepted by the Consultant as the most durable and highest quality

**3. EXECUTION**

1. Condition of Substrates

1. Surfaces to receive resilient flooring shall be dry, true, even and smooth, and free of paint, grease and oil. Surfaces to receive resilient base shall be even, smooth, free of gaps, holes and depressions.
2. Ensure moisture content of substrate is 12% or less. Perform moisture tests on concrete substrates where moisture content is uncertain. Perform tests in minimum ambient temperature of 18° C. Surface pH of the concrete should range between 7 and 9. If the test results exceed the limitations, the installation must not proceed until the problem has been corrected. Do not install materials until test results are satisfactory.
3. Concrete slabs shall be at least 28 days old before installation of resilient flooring.
4. Concrete shall be prepared utilizing ASTM F 710, Practice for Preparing Concrete Floors and Other Monolithic Floors to Receive Resilient Flooring.

2. Preparation

1. Level depressions, cracks and joints in subfloor with non-shrinking type filler compatible with bonding adhesive. This includes all cracks and gaps in existing wood slat flooring.
  2. Sand existing clear coat finishes from all stained wood slat floor finishes, which are to remain to form subfloor surface for new resilient floors, to acceptance of manufacturer
  3. If recommended by the adhesive or flooring manufacturer, prime substrates. Apply primer in accordance with manufacturer's instructions.
3. Underlayment
1. Where resilient flooring abuts other flooring of different thickness, provide cementitious underlayment allowing smooth and level transition between finished floor surface. Feather for at least 1 metre. Mix, apply and finish underlayment in accordance with manufacturer's instructions.
  2. Provide all repairs to existing underlayment, including layers of 1/8" plywood underlayment as required to ensure full area of underlayment surface capable of receiving new flooring.
4. Floor Installation General
1. Install resilient flooring materials in accordance with material manufacturer's current printed directions. Keep a copy of manufacturer's installation manual on site during execution of work.
  2. The installation of homogenous flooring should not begin until the work of all other trades has been completed, especially overhead trades.
  3. Scribe flooring to walls, columns, cabinets, floor outlets and other appurtenances to produce tight joints. Extend flooring into recesses and closets.
  4. Locate change to different floor finish or colour centre under doors.
  5. Provide reducer strip fully bonded where floor covering terminates exposing edge of floor.
  6. Provide adaptor where resilient flooring meets ceramic tile.
  7. In areas that are exposed to intense or direct sunlight, the product must be protected during the conditioning, installation, and adhesive curing periods, by covering the light source.
5. Resilient Application
1. Install flooring in accordance with manufacturer's instructions.
  2. Install adhesives in strict conformance with manufacturer's instruction. Apply adhesive uniformly using recommended trowel. Do not spread more adhesive than can be covered by flooring before initial set takes place.
  3. Run sheets in direction of traffic. Install patterns and layouts to Consultant instructions and as generally indicated on drawings. Minor requested alterations to pattern of installation shall be without increase in the Contract Price.
  4. Follow manufacturer's written instructions for order of placement of dye lots and for orientation of tiles to agreed orientations and reversals or turns after mockup for Owner and Consultant and agreed patterning of tile direction.
  5. Seal corners.
  6. Make watertight connections to floor drains and plumbing fixtures.
  7. As installation progresses, and after installation, roll flooring with roller of weight recommended by the manufacturer to ensure full adhesion.

8. Material installed under heavy dynamic or static loads shall use a specialized firm setting adhesive, as recommended by flooring manufacturer. Provide manufacturer's review of the Project and written recommendations.
6. Resilient Base
  1. Adhesive apply straight and coved bases to vertical surfaces so that gaps do not occur behind base, to that front lip of base cove bears firmly and uniformly on floor surfaces and so that good and permanent bond is produced between base and surface to which it is applied.
  2. Use full length pieces; accumulated short lengths not permitted. Heat form, backscore and wrap base around external corners. Do not use preformed corners. Mitre inside corners; butt intermediate joints flush without gaps.
7. Tactile Hazard Warning Indicators
  1. Install in strict conformance with requirements of Authorities Having Jurisdiction including OBC and AODA, whichever is the stricter.
  2. Install tactile hazard indicators working from the centre of stairs and or ramps outward to adjacent vertical assemblies, for full width of stairs.
  3. Install indicators recessed within adjacent flooring finishes, for level transitions.
  4. At stairs, locate the tactile hazard warning indicators starting one tread depth back from the leading edge of the top stair. This dimension may differ depending on the stair conditions. Job Check all such conditions prior to installation.
8. Cleaning and Finishing
  1. Wash resilient floors; leave them clean, free of building materials, rubbish, paint, adhesives, stains and spills.
  2. This contract requires that all resilient floors are cleaned in strict accordance with manufacturers' instructions for Annual Maintenance, using the products that the manufacturer has identified as available from normal maintenance supply firms in the Waterloo, Ontario area.
  3. Provide all required maintenance information in manuals, and provide training for Owner's maintenance staff in the care of all flooring. Allow in the Contract Price for a full demonstration of each cleaning and finishing process, using the Owner's equipment.
9. Protection
  1. Prohibit traffic on floor for 48 hours after installation. Protect installation until handover of the Work. Replace gouges, damage, and dents by removing sections of flooring and replacing unless patch is acceptable to Owner, at no cost to Owner.
10. Maintenance Instruction and Maintenance Materials
  1. Instruct Owner's designated staff in the care and maintenance of resilient flooring, troubleshooting, stain removal and replacement. Provide recommendations for furniture feet, chair castors and other furnishings that may be installed on the finished Work.
  2. Provide maintenance materials in complete and re-sealed original packaging and obtain receipt from Owner. Submit the receipt to the Consultant.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated herein.
2. It is the intent of this specification to establish standards for paints and coatings, and to describe standards for installation. All trade contractors and the Contractor shall be mindful that paintings and coatings shall be shop prepared and shop applied wherever possible for components forming part of the Finish Systems.
3. Commencement of painting or coating application by the Contractor shall be deemed as Contractor's certification that the substrate has been prepared to the necessary standard to ensure coatings can provide finish characteristics required by the Quality provisions of this Contract. In particular:
  1. Finishes to architectural woodwork and wood finish carpentry described in Sections 062000 and 064000 shall be shop-applied and all such work shall be performed by the carpentry and woodwork trade contractor to the standard identified in this Section.
  2. The work of this Section includes provision of paint finishes to all steel doors, frames and similar, wherever located in the Work. Opposite faces of doors shall receive different colours and finishes where noted, and different again from frames.

### 2. Related Requirements

- |                                      |                           |
|--------------------------------------|---------------------------|
| 1. Indoor Air Quality                | Section 018080            |
| 2. Selective Demolition              | Section 024119            |
| 3. Finish Carpentry                  | Section 062000            |
| 4. Architectural Woodwork            | Section 064000            |
| 5. Joint Protection                  | Section 079000            |
| 6. Openings                          | Division 08               |
| 7. Non-Loadbearing Studs & Boardwork | Section 092000            |
| 8. Mechanical                        | Division 20 & Mech. Docs. |
| 9. Electrical                        | Division 26 & Elec. Docs. |

### 3. Submittals

1. Submit in accordance with Division 1:
  1. Product Information for all Paint and Coating Products in the Work.
  2. Submit minimum 8" by 10" (200mm by 255mm) "architectural drawdowns", of each paint colour, type, and sheen proposed for use in accordance with Consultants' selection of colours and project requirements. Revise and resubmit as many times as may be required to ensure Consultant and/or Owner acceptance of draw-downs.
  3. Submit minimum 6" x 12" (150mm by 300mm) samples of wood stains on hardwood, to confirm stains to acceptance of Consultant.
  4. Upon completion of Work, name and colour members of paint used, in form of a colour schedule in MS Excel format showing each room, for future reference and maintenance.

### 4. Work Schedule

1. Apply coatings only after all other Sections have completed their work.

2. Co-ordinate work of this Section with that of Section 079000 and review order of installation with Consultant where sealants are installed adjacent to painted surfaces.
5. Reference Codes and Standards
  1. Master Painters Institute (MPI): Architectural Painting Specifications Manual, latest issue. All formulae must be "premium" or better.
6. Quality Assurance
  1. Retain purchase orders, invoices and other documents to prove that all materials utilized in this contract meet requirements of the specifications. Produce documents when requested by Consultant.
  2. Standard of Acceptance shall be top of line PPG Industries products, high performance water-borne acrylic and epoxy paints, except where otherwise noted herein for specific substrates. Standard of acceptance is PPG-Dulux Diamond for work to boardwork and AkzoNobel Devoc specialty coatings for other substrates.
  3. Final coat to exhibit authenticity of colour, full coverage and protection in accordance with paint manufacturers' recommendations, and uniformity of sheen across full surface area.
7. Basic Product Requirements
  1. Deliver and store materials in original containers, sealed, with labels intact.
  2. Remove damaged, opened and rejected materials from site.
  3. Provide and maintain dry, temperature controlled, secure storage.
  4. Observe manufacturer's recommendations for storage and handling.
  5. Store materials and supplies away from heat generating devices.
  6. Store materials and equipment in a well-ventilated area with temperature range 7° to 30° C.
  7. Store temperature sensitive products above minimum temperature as recommended by manufacturer, and in accordance with fire safety precautions.
8. Basic Execution Requirements
  1. Environmental Conditions
    1. Maintain temperature in interior areas to receive coatings between 15° to 25° C for at least 24 hours before, during application and until coatings have cured after application. Apply exterior coatings only when temperature is above 10° C.
    2. Do not apply coatings under direct sunlight during hot weather.
    3. Adequately ventilate areas where coatings are being applied. Maintain a dust-free atmosphere for duration of coating work and setting of coatings.
  2. Protection
    1. Protect paint and painting equipment before use and during length of contract from climatic elements.
    2. Protect other work from markings and other damage. Protect completed work from paint droppings. Use non-staining coverings.
    3. Protect adjacent surfaces not scheduled to receive coatings from damage.

4. Remove electrical plates, surface hardware, fittings and fastenings prior to painting operations. These items shall be carefully stored, cleaned and replaced on completion of work in each area. No solvent shall be used to clean hardware that will remove permanent lacquer finish on these items.
  5. Mark labels and specification plates occurring on equipment to be painted.
  6. Post “wet coating” and “no smoking” signs while work is in progress and while coatings are drying.
  7. Keep oil rags, wastes and other combustible materials in closed metal containers and remove at end of each work day. Take every precaution to avoid spontaneous combustion.
9. Maintenance Materials
1. Upon completion of work provide one sealed and properly identified 4 L can of each type and colour of paint used on this project. Mark side of can with drawdown information.
  2. Only top coating paints used in building interior are required for maintenance materials.
10. Warranties
1. In accordance with Division 1 requirements and GC12.3.1 and 12.3.4 as amended.
11. Indoor Air Quality
1. Conform with requirements as Indoor Air Quality Requirements 018080 and as follows.

1. All paints and coatings that are applied onsite and fall within the building weather barrier must have a VOC content less than the limits of Green Seal Standards GS-11 and GC-03 and the State of California’s South Coast Air Quality Management District (SCAQMD) Rule 1113. SCAQMD Rule 1113 has a revised edition dated February 5, 2016. All VOC contents limits for this Project are revised to that standard or better.

2. The VOC content limits of Green Seal Standard GC-03 are as follows:

<b>Anti-Corrosive Paints</b>	<b>VOC Limit (g/L)</b>
Anti-Corrosive Paint, Gloss	250
Anti-Corrosive Paint, Semi-Gloss	250
Anti-Corrosive Paint, Flat	250

3. The VOC content limits of SCAQMD Rule 1113 are as follows:

<b>Coatings</b>	<b>VOC Limit (g/L)</b>
Bond Breaker	350
Clear Wood Finish, Varnish	275
Clear Wood Finish, Sanding Sealer	275
Clear Wood Finish, Lacquer	275
Clear Brushing Lacquer	275
Concrete-Curing Compound	350
Dry-Fog	400
Fire-Proofing Exterior Coating	350
Fire-Retardant Coating, Clear	650
Fire-Retardant Coating, Pigmented	350
Flat Coating	100
Floor Coating	50
Industrial Maintenance Coating	100

Painting and Coating

High Temp. Industrial Maintenance Coating	420
Zinc-Rich Industrial Maintenance Coating	100
Japans/Faux Finishing Coating	350
Magnesite Cement Coating	450
Multi-Colour Coating	250
Non-Flat Coating	50
Pigmented Lacquer	275
Pre-Treatment Wash Primers	420
Primer, Sealer and Undercoating	100
Shellac, Clear	730
Shellac, Pigmented	550
Specialty Primer	100
Stains	250
Stains, Interior	250
Low-Solids Coating	120

12. Identification of Building Systems

1. The work described by this Section forms components of the Interior Finishes System. Comply with requirements for the integration of the work described in this Section into its roles in the various systems. Provide the work so that the performance requirements of the overall system of which it forms part is achieved.

**2. PRODUCTS**

1. Materials

1. Paint materials to be PPG Industries products or equivalent by Sherwin-Williams or Benjamin Moore. Specific products shall be selected in accordance with MPI Manual, "Premium" formulae for each substrate and condition, and further
  1. Direct-to-metal high performance water-borne epoxy semi-gloss for all metal substrates, AkzoNobel Devoe coatings formulated as recommended by manufacturer for specific substrate and service condition, or accepted equivalent.
  2. Finish coats shall be high performance water-borne acrylics for interior boardworks, PPG-Dulux Diamond or accepted equivalent, fully compatible with restoration stain block primers. Eggshell to ceilings, Eggshell to walls, semi-gloss to doors and frames unless otherwise directed by Consultant. Review all glosses with Consultant prior to confirming paint orders, as part of the submission process.
  3. Standard for epoxy wall coatings shall be PPG Aquapon WB EP Waterborne Epoxy Semi-Gloss Coating, or accepted equivalent.
  4. Standard for exterior shall be top of line waterborne acrylic exterior finish, semi-gloss.
2. Paints shall be factory mixed unless otherwise specified, except any coating in paste or powder form, to be field-catalyzed shall be field-mixed in accordance with manufacturer's directions.
3. Primer
  1. As specified by the Paint Manufacturer, and fully compatible with finish coats.
  2. Primers for all impact and abuse-resistant board shall be as for masonry block, block filler formulated to achieve complete coverage of board and joint surfaces so that jointwork and panel areas are indistinguishable from each other from any angle under any lighting condition.

3. Primers to existing wallboard shall be top-of-the-line shellac based restoration stain blockers, purpose made to block stains and odours from fire, water, and urine, and to seal stains from grease, rust, creosote, lipstick, crayon, pencil, marker and other graffiti. Zinsser B.I.N® Shellace Base Primer Ultimate Stain Blocker, or equivalent by PPG,
  4. Prime all masonry whether existing or new using Tru-Glaze-WB 4426 thinned 8:1 with water or prime with Tru-Glaze-WB 4030 or 203 waterborne epoxy primers. Dry over night to recoat. Fill concrete block with Tru-Glaze WB 4015 filler. These fillers must dry overnight before coating.
  5. Thinners, cleaners: as recommended by the paint manufacturer, and to Division 1 requirements for sustainability and VOC content.
  6. Stains
    1. Stains for wood shall be equivalent to Behr, Sherwin Williams, Benjamin Moore, PPG, or Minwax, low-voc, formulated to develop colour and appearance to match wood door plastic laminate selection, when applied to specified hardwood substrates.
    2. Submit duplicate sample(s) and adjust as required by Consultant.
    3. Provide consistent stain finishes.
    4. All stains for application whether in shops or onsite shall use the same formulation, regardless of multiple trade contractors.
    5. Stain finishes shall be further finished with clear coat sealer to suit species. For maple, use catalyzed lacquer.
2. Colours
1. Perform all colour tinting operations prior to delivery of paint to site, to match reviewed and accepted drawdowns.
  2. Second coat in a three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.
  3. The Owner may select colours from a full spectrum of colour.
  4. The work of this Contract includes all work to finish each storey of the building (Basement Floor, Ground Floor, Second Floor, and Third Floor) with a different and distinct colour scheme from each of the other storeys, to aid in way-finding and address. Different colours may therefore be selected for the walls, accent walls, ceilings, door frames, doors, and special elements of each of these storeys.
  5. Further to the above, the Owner may select a change in colour and/or sheen, in the application at any change in surface.
  6. At time of drawdown submission, identify any colour selection that may not appear in the finished work as per the drawdown because of the specific colour, finish coating product, and/or substrate or any relation among them. The Contractor is specifically cautioned that failure to achieve colour matches to drawdowns in the finished work will require further finish coats to achieve the selected colour without further cost to the Owner.
3. Finishes
1. Paint colours shall be generally as set out in the List of Interior Finishes and on Interior Elevations. However, further colours will be confirmed during construction. Owner reserves the right to choose several colours to the same wall surface, and different colours for individual system elements such as ducts or structures.

2. Contractor shall co-ordinate the bidding and work to ensure that exposed piping, ductwork and conduits except within mechanical and boiler rooms receives paint finishes unless specifically noted otherwise on drawings, by the Painting Trade Contractor.
3. Exposed piping, ductwork and conduits in mechanical and boiler rooms, and such systems elsewhere in and surrounding the building including rooftop, need not receive paint finishes unless specifically noted otherwise in documents or required by Code.

### 3. EXECUTION

#### 1. General

1. Perform all painting operations in accordance with best practices of the MPI Architectural Painting Specifications Manual "Premium" systems except where specifically stated otherwise in the Contract. Apply all paint and coating materials in accordance with paint manufacturer's written application instructions.

#### 2. Preparation for Tasks

1. Ensure that workers are informed of safety rules.

#### 3. Protection

1. Protect existing building surfaces not to be painted from paint spatters, markings and other damage. If damaged, clean and restore such surfaces as directed by Consultant. Cover or mask floors, windows and other ornamental hardware adjacent to areas being painted to prevent damage and to protect from paint drops and splatters. Use non-staining coverings.

#### 4. Cleaning

1. Cleaning described by this section shall be in addition to cleaning described in Section 024119, to a higher standard for all existing and new elements and surfaces to receive paint finishes.
2. Clean all surfaces to be painted, whether existing or new, as follows:
  1. Remove all dust, dirt, and other surface debris by wiping with dry, clean cloth.
  2. Wash surfaces with solution of cleaners that do not leave residue, and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
  3. Spot clean areas of graffiti media – including but not limited to media such as permanent marker, shall be treated with denatured alcohol or acetone.
  4. Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface and no residue remains.
  5. Allow surfaces to drain completely and allow to dry thoroughly before coating.
  6. Provide cleaning of all surfaces, even where such surfaces are scheduled to receive restoration stain block primers.
3. Prevent contamination of cleaned surfaces before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.
4. Cooperate with other trades for items to be pre-painted prior to installation.
5. All door edges must be finished immediately that doors arrive to site. Do not paint out fire protection labels.

5. Conditions of Substrates

1. Sound, non-dusting, and free of grease, oil dirt, and other matter detrimental to adhesion and appearance of coatings. Commencement of finishing means acceptance of conditions.
2. Temperature minimum 15° C.
3. Moisture content: maximum 12%. Test for moisture content using moisture meter.
4. Alkalinity: test cementitious substrates for alkalinity. Use method recommended by coating manufacturer.

6. Surface Preparation - General

1. Prepare and ensure preparation by other trades of each substrate of following materials according to listed painting standards.
2. Where possible, prime all surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.
3. Follow related recommendations on surface preparation methods in OPCA Guide to paint specifications.
4. Surface preparation methods and tools to be used are to be agreed by Owner and supplier of Product to be painted.

7. Preparation of Substrates - Specific

1. All substrates: clean as required to produce an acceptable surface. If wood, metal or any other surface to be finished cannot be put in proper condition for finishing by cleaning, sanding and filling as specified, notify Consultant in writing or assume responsibility or rectify any unsatisfactory finish resulting.
2. Wood generally: clean soiled surfaces, sand smooth and dust off; putty nail holes, splits, scratches, after prime coat has been applied and dried; colour putty to match finish; putty stained wood after stain application.
3. Wood for paint: clean knots, pitch streaks and sappy sections of residue and seal with sealer before applying prime coat.
4. Stain and clear finish to woods shall be as described in Section 062000. Co-ordinate shop and field prep with trades providing benches and other wood items for clear or stained finishes.
5. Bare ferrous metal: remove rust and scale; wash with solvent; chemically clean; apply coat of direct-to-metal finish as primer.
6. Previously primed metal: remove rust, oil, grease and loose shop paint by washing or wire brushing; make good shop coat; ensure shop coat is direct-to-metal in accordance with this Section. If confirmed, feather out edges of touch-up. If shop coat is other, obtain Consultant's review and acceptance of condition of substrate to receive new direct-to-metal finish as primer, and provide a full coat of such finish, as primer, at no cost to Owner. Contractor and Painting Trade Contractor shall reconcile and the supplier of the faulty material shall be back-charged.
7. Zinc-coated metal: wash and etch to dull paint receptive surface using an approved crystalline zinc phosphate or vinyl pretreatment.
8. Hot dip galvanized steel: vinyl wash prime unless not recommended by finish coat paint manufacturer, in writing.
9. Unit masonry and concrete: fill minor cracks, holes and fissures with Polyfilla and smooth to a flush surface. Texture filled areas to match surrounding surface.

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10. Gypsum board: fill minor cracks, holes and fissures with patching plaster, and smooth to a flush surface; sand taped joints and remove dust.
  11. Alkaline surfaces: wash and neutralize using proper type of solution compatible with paint to be used.
  12. Plaster: fill minor cracks, holes and fissures with patching plaster, allow to dry, and smooth to a flush surface and texture filled areas to match surrounding surface.
8. Spot Priming and Sealing
1. Spot prime knots and resinous areas of wood to standards of CPCA manual, whether existing or new. All knot and resin areas of wood to receive new paint finishes must not bleed such markings through new finishes.
9. Paint Application
1. Apply paint by spray or roller methods except where not practical because of protection or masking difficulties.
  2. Roller or brush painting may be permitted where deemed advantageous and shall be subject to Consultant's acceptance. Provide spray application as the norm, using only airless spray guns. Consultant may prohibit use of spray painting at any time for such reasons as carelessness, poor masking or protective measures, drifting paint fog, disturbance to other trades or failure to obtain a uniform satisfactory finish.
  3. Brush application shall be kept to a minimum:
    1. Work paint into cracks, crevices and corners.
    2. Brush out runs and sags.
    3. Remove runs, sags and brush marks from finished work and repaint.
  4. Standard of Care and Coating Requirements is that no flashing, differences in sheen, dust entrapment, or change in colour, texture, or sheen can be seen under any light condition including grazing from a distance of 1.5 m. Consultant's determination is final. Make good all defects to this standard by providing further preparation, sanding, and coatings to entire areas. Touch ups of spackling and boardwork must be re-primed and whole surfaces refinished to even finish.
    1. Apply each coat of paint as a continuous film of uniform thickness.
    2. Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
    3. Applied and cured coats of paint shall be uniform thickness, sheen, colour and texture and free from brush or roller marks, sags, crawls and other defects detrimental to appearance and performance. Repaint thin spots or bare areas before next coat of paint is applied.
    4. Apply sufficient paint for primer, intermediate and finish coats.
    5. Thoroughly mix materials before application.
    6. Where two or more coats of same paint are to be applied, undercoats shall be tinted in lighter shades of final coat to differentiate from final coat.
    7. Finish tops of projecting ledges, both above and below sight lines.
    8. Finish top, bottom, edges and cutouts of doors after fitting.
    9. Touch up suction spots after application of first coat.

10. Sand and dust between each coat to remove visible defects.
  11. Each coat of finish shall be dry and hard before succeeding coats are applied with a minimum of 24 hours between coats, unless manufacturer's instructions state otherwise.
  12. Stained woodwork shall be covered with a uniform coat of stain and wiped off if required. Wood shall have a uniform shade. Match stain so that dissimilar woods have uniform finished appearance.
10. Work to Existing Building
    1. Prep and coat existing surfaces, elements, and substrates after re-priming and preparation in accordance with MPI manual for best adhesion and quality of finish. Inspect existing surfaces in the Facility that are to receive new finishes and report any defects to the Consultant and Contractor. Commencement of coatings applications shall be deemed acceptance that coatings performance and quality shall be as for new work and substrates.
  11. Protection of Completed Work
    1. Protect areas where paint has been applied from possible contamination caused by surrounding environment and also from passing pedestrian traffic, visiting public and other trade activities.
    2. Avoid scuffing newly applied paint.
    3. On completion of specified work remove surplus materials, tools and equipment and debris on work area; leave clean and tidy to complete satisfaction of Consultant.
  12. Schedule of Finishes - General Requirements
    1. Paint or otherwise finish surfaces of building materials, building surfaces and building accessories not otherwise protected or covered, as shown on Finish and Door Schedules, drawings, and as selected by Owner from full colour spectrum. Owner may choose further and different colours for structure and other systems elements than general surface substrates, and may choose several colours for general surface substrates.
    2. In addition to finishing required by Room Finish and Door Schedules, Drawings and these specifications, and unless otherwise specified, all new work which is exposed to view and which is not pre-finished shall be finished by this section.
    3. In areas specifically designed as "unfinished" painting is not required except for bare, primed and zinc coated metal surfaces (including structural columns and beams) and insulated ductwork and pipe, which shall be finish painted.
    4. Where exposed to view paint bare metals, previously primed metals and zinc coated metals unless specified otherwise.
    5. Paint behind surface mounted fixtures on walls and ceilings with full coats of paint.
    6. Paint inside surfaces of light coves white.
    7. Finish tops and bottoms of doors, trim, projections and other work as specified for surrounding work whether above sight lines or not.
    8. Finish edges of doors to match face of door. Refinish edges of doors after fitting.
    9. Paint tops, bottoms and edges of storage shelves with full specified coats, whether exposed to view or not.

10. Paint interior of ducts at grilles and diffusers with two coats of flat black paint, so that duct interior is not visible when grilles and diffusers are installed.
  11. Paint piping, ducts, and conduits in areas and rooms where such elements are exposed in the finished work. Except for Mechanical and other service rooms, use colours matching background wall or ceiling colours, unless otherwise directed by the Consultant. For Mechanical Rooms and service rooms, paint in accordance with the Owner's requirements for piping, duct, and conduit colours. Identification marking shall be performed by the Trade Contractor installing the building system of which the element forms part.
  12. Unless specifically indicated to be painted, all finish carpentry work shall receive a stained and transparent finish by Section 062000 and Section 064000, except any open storage shelves, which shall receive opaque colour paint finish by this Trade Contractor.
  13. Unless specifically indicated otherwise paint all rooftop equipment and components, regardless of material and finish, including but not necessarily limited to mechanical rooftop equipment, vent stack flashings, sleeve flashings window washing anchors, but not including pre-finished sheet steel flashings.
  14. Where finishing formula for surfaces requiring painting is not included hereunder, follow recommendations of Canadian Painting Contractor's Association Architectural Painting Specification Manual, latest issue.
13. Specific Finishes - Not a complete list, see also room finish schedules and Other Sections.
1. As described in the Finish Schedules, and on drawings.
  2. Pre-paint ventilation grilles where not pre-finished. Devco coatings semi-gloss. Spray only.
  3. Paint steel doors and frames unless pre-finished. Devco Coatings. Brush or roller acceptable only where finished product is without brush or roller marks. Otherwise mask and spray.
  4. Paint soffits and ceilings. Glidden Diamond 350 eggshell.
  5. Paint partitions. Glidden Diamond semi-gloss.
  6. Paint all exposed conduit, ducts and piping in the exposed work, unless pre-finished.
  7. Paint all piping insulation exposed in the finished Work.
  8. Paint all interior masonry.
  9. Stain millwork, trim, sill woodwork and other elements in shop wherever possible. All such work shall be performed by the woodwork trade contractor and finish carpenter, to the standards of this Section and Sections 062000 and 064000.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated herein.

### 2. Related Requirements

- |                                       |                     |
|---------------------------------------|---------------------|
| 1. Cash Allowances                    | Division 01         |
| 2. Existing Conditions                | Division 01         |
| 3. Removals of Existing               | Section 024119      |
| 4. Existing Concrete                  | Existing Conditions |
| 5. Masonry                            | Division 04         |
| 6. Rough Carpentry                    | Section 061000      |
| 7. Finish Carpentry                   | Section 062000      |
| 8. Steel Doors and Frames             | Section 081113      |
| 9. Glazing to Openings                | Section 088000      |
| 10. Interior Finishes System          | Section 090500      |
| 11. Non-loadbearing Studs & Boardwork | Section 092000      |
| 12. Painting and Coatings             | Section 099000      |
| 13. Installation of Owner Equipment   | Division 11         |

### 3. Cash Allowance

1. Types of building signage are as specified below.
2. For the purposes of this Contract, the material supply cost of the building signs shall be as defined in Section 012020, Cash Allowances.
3. Installation of building signs, including blocking and rough-in requirements, is included in the Work and the Contract Amount, but not in the Material Supply Allowance. Perform all work required to install accessories in accordance with Contract requirements, at no further cost to Owner.
4. Where the Owner's nominated Signage Supplier proposes to install the signage supplied under cash allowance, the installation costs carried by the Bidders shall be credited from the Contract Price.

### 4. Supply of Signs

1. Room and Door Identification Signs, by this Section.
2. Way-finding Signage, by this Section.
3. Caution Signs, to warn against hazards due to tripping and/or collision, by this Section.
4. Equipment identification signage is described in Mechanical and Electrical, and shall be performed as described therein, by the trade undertaking such Section without further expense to Owner.
5. Exterior Building identification signage shall be supplied and installed by the Owner, n.i.c.
6. Locker number identification signage is described in Section 105100, and shall be supplied and installed by that Section, and not by the Cash Allowance.
7. Signage required at all Emergency Call Assist Systems to washrooms is described in Section 102800, and shall be supplied by that Section, and not by Cash Allowance. Installation of such signage shall be as set out in this Section.
8. Fire Alarm Passive Graphic, as described in Section 283100, and which shall be supplied and installed in Contract by the Fire Alarm Trade Contractor, and not by the Cash Allowance.

5. Submittals
  1. Contractor shall obtain submittals from Owner nominated supplier(s) of building signage, and shall submit fabrication drawings in accordance with Division 1 requirements.
  2. Submit fabrication drawings.
6. Warranty
  1. Warranty in accordance with Division 1 requirements:
    1. Installation of signs against loss of adhesion or fading for a period of 5 (five) years from date of Substantial Performance, or date of installation of signage, whichever is later.
7. Building Systems Requirements
  1. The work described by this Section is a component of the Emergency Egress System, the Barrier-free Path-of-travel System, and the Interior Finishes Building Systems. Comply with requirements for the integration of the work described in this Section into its roles in the various systems. Provide the work so that the performance requirements of the overall system of which it forms part is achieved.

## 2. PRODUCTS

1. General
  1. Signs may include some or all of the following:
    1. Room Identification Signage
    2. Way-finding and Directional Signage
    3. Administrative Signage
    4. Warning and Alarm Signage
    5. Barrier-Free Signage Required by Code
  2. Fastening: sign-grade double-sided adhesive tape, Tesa 51970 or 3M automotive panel trim adhesive tape. No substitutions permitted.
2. Schedule of Specific Building Signs
  1. In addition to the general signage types indicated above, the Contract includes the following specific building signs to be supplied by Cash Allowance, to be installed under this Contract:
    1. Room Identification Signage
      1. Allow for installation of 1 (one) room identification sign to each and every door in the building, whether existing or new, for adhesive fastening.
    2. Way-finding Directory Board Signage
      1. Allow for installation of 2 (two) directory board signs to each floor level (one in front of each elevator door, and one in front of each door from the main stairs to each floor) for adhesive fastening.
    3. Barrier Free Entrance Signage
      1. 12" (300mm) wide x 18" (450mm) tall, rounded corners; white reflective background with black border, directional arrow and the words "ENTRANCE" in capitals; and blue barrier-free symbol, for mounting to face of existing building at barrier-free entrance.

2. Allow for installation of 2 (two) entry signs, adjacent to each accessible building entry to the building interior from the covered Breezeway.
4. Exit Stair and Floor Numbering Signage
  1. Exit Stair identification signage is required to both sides of all doors exiting into existing exit stairs, as well as to the main circulation stair, to each Floor Level, in accordance with OBC3.4.6.19.
5. Warning and/or Caution Signage
  1. Trip and fall hazard identification signage, required to interior circulation stairs. Allow for installation of 24 (twenty-four) signs, for adhesive fastening.
  2. Video Surveillance Signage. Allow for installation of 4 (four) signs mounted to the interior of the building, to the Owner's selection.
  3. Bidders are cautioned that the above video surveillance signs are not to be confused with the site-mounted video surveillance signage required to be provided under Section 323020. The provision of such signage is included in the Contract, and not the material supply cash allowance.
  4. Collision Warning identification signage. Allow for installation of 6 (six) signs, mounted to the interior of the building, where existing service piping or ductwork is routed below 6'-6" (2,000mm) a.f.f.

### 3. EXECUTION

1. General
  1. Erect and secure signs plumb and level at elevations and locations as directed onsite by Consultant.
  2. Comply with sign manufacturer's installation instructions.
  3. Do not install signs until all finishing work is complete and cured.
2. Relocated Signs
  1. Relocate signage for Fire Extinguishers to suit new location of these items, and install new signage for new locations. Otherwise all signage is new as per this Section.
3. Door and Room Signs
  1. Use self-stick adhesive sign-grade tape to manufacturer's instructions to adequately fix sign and prevent "rocking". Keep tape maximum 1.5 mm from edges.
  2. Install door signs to requirements of AODA requirements and best practice.
  3. Do not drill doors under any circumstance.
4. Aluminium Sign-holders
  1. Use self-stick adhesive sign-grade Tesa tape to manufacturer's instructions to adequately fix sign and prevent "rocking". Keep tape maximum 1.5 mm from edges.
  2. Install sign-holders at heights and in locations of Owner's choosing, to a variety of substrates. Ensure install heights conform to requirements of Authorities for accessibility. Such requirements shall govern over Owner's instructions no exceptions.

3. The Contractor shall allow for the installation of 4 (four) sign holders, one to each floor level, at no cost to Owner.
5. Fire Plan and Safety Signage
  1. Use self-stick adhesive sign-grade tape to manufacturer's instructions to adequately fix sign and prevent "rocking". Keep tape maximum 1.5mm from edges.
  2. Review location of fire and safety signage with authorities having jurisdiction during pre-occupancy inspection, and agree on ALL locations with authority and Owner. Install sign-holders at agreed heights and locations, to a variety of substrates.
6. Cleaning and Protection
  1. Leave signs clean. Remove debris and dispose of any adhesive backing strips.
  2. Protect signs until handover of Work. Replace units with any damaged finishes.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated herein.

### 2. Related Requirements

- |                                      |                          |
|--------------------------------------|--------------------------|
| 1. Existing Conditions               | Section 024119           |
| 2. Rough Carpentry                   | Section 061000           |
| 3. Finish Carpentry                  | Section 062000           |
| 4. Joint Protection                  | Section 079000           |
| 5. Interior Finishes System          | Section 090500           |
| 6. Studs and Boardwork               | Section 092000           |
| 7. Wall, Floor and Ceiling Finishes  | Division 09              |
| 8. Washroom and Shower Accessories   | Section 102800           |
| 9. Owner Supplied Equipment          | Division 11              |
| 10. Plumbing Fixtures (Shower Units) | See Mechanical Documents |
| 11. Luminaires                       | See Electrical Documents |

### 3. Submittals

1. Submit data in accordance with Division 1 requirements and:

1. Submit copies of all partition layouts, material thicknesses, construction, details, drawings and shop detail drawings. Indicate dimensions of partition units and layout. details of reinforcing and blocking required, and details of all anchorage, fastening, and connections. Submit duplicate samples of colour choices from standard colour ranges for Owner's selection.

### 4. Co-ordination

1. Co-ordinate the Work of this section with WC accessories, and interior finishes.

### 5. Quality Control

1. Work of this Section shall be performed by forces approved by partition manufacturer. Submit evidence of installation qualification on manufacturer's letterhead.
2. Stalls and partition layouts for washrooms forming part of barrier-free paths of travel, or where HC accessible fixtures are shown, shall be provided to meet regulatory requirements for OBC barrier-free access and City Accessibility Standards.

### 6. Warranties

1. Work of this Section shall be warrantied in accordance with General Conditions and Division 1 requirements against defects in Product, material and workmanship for two years following Substantial Performance of the Work.

### 7. Maintenance Manuals

1. Submit operation and maintenance data in accordance with the general requirements. Include description of maintenance, adjustments, and part list for replacements.

### 8. Building System Requirements

1. The Work of this section forms components of the barrier-free path of travel system and the interior finishes system. Comply with requirements for performance and execution of systems.

## **2. PRODUCTS**

1. Toilet Partitions
  1. Standard of Acceptance shall be Hadrian or equivalent by GSS or Global.
  2. Toilet Partitions shall be pre-finished powder-coated steel, reinforced floor and ceiling braced, all panel material shall be 1" (25mm) nominal thickness with fine radius edge, height to suit existing ceiling heights unless otherwise shown, and complete with all stainless steel shoes, rails, fittings and hardware. Provide all fittings and hardware with tamperproof fasteners to suit specific substrates.
  3. Finish shall be anti-graffiti coating, colour to Consultant selection from standard colour ranges.
  4. Hinges shall be continuous piano-type, gravity-close for direct mounting to jambs of openings where indicated. All pulls shall meet ADA and OBC barrier-free requirements.

## **3. EXECUTION**

1. Preparations
  1. Take onsite measurements after erection of work upon which the work of this Section depends. Inspect for levels and ensure allowances for floor falls, and final thicknesses of tile and other finish installations. Note that tile may not extend full height of toilet partitions or through headrail height. Do not commence installation until all other finishes are in place and have been accepted by the Owner and Consultant.
2. Installation
  1. Install compartments in rigid, substantially braced and anchored fashion, level, plumb, and true, with uniform gaps between doors, pilasters, and panels not to exceed 5mm. Keep onsite drilling and fitting to a minimum. Adjust function of all operating hardware for best fit and function. Replace damaged panels howsoever caused at no cost to the Owner, promptly upon notification from the Consultant of unacceptable defects or touch-ups.
3. Clean up
  1. Clean and protect installation until handover of the Work to the Owner.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.

### 2. Related Requirements

- |  |                      |
|--|----------------------|
| 1. Rough Carpentry                     | Section 061000       |
| 2. Finish Carpentry                    | Section 062000       |
| 3. Architectural Woodwork              | Section 064000       |
| 4. Interior Finishes System            | Section 090500       |
| 5. Non-Loadbearing Studs and Boardwork | Section 092000       |
| 6. Flooring Finishes                   | Division 09          |
| 7. WC Accessories & Specialties        | Division 10          |
| 8. Owner Supplied Equipment            | Division 11          |
| 9. Electrical Devices                  | see Electrical Docs. |

### 3. Abbreviations

1. For the purposes of this Contract, the following abbreviations may be used:
  1. CG denotes Corner Guards;
  2. CR denotes Chair Rails; and
  3. WG denotes Wall Guards.

### 4. Submittals

1. Submit in accordance with Division 1 requirements:
  1. Shop drawings for all Products.

### 5. Reference Standards and Codes

1. Provide laboratory certification confirming construction flame spread of 150 or less, and smoke index of 10 or less, when tested in accordance with the provisions of ASTM Designation E-84-97a, (Standard Method of Test for Surface Burning Characteristics of Building Materials) except for methods of calculating flame spread rates. Provide Canadian equivalency for tests under the Ontario Building Code, and submit to Consultant and authority.

### 6. Basic Execution Requirements

1. All wall guards shall be secured by adhesive AND fasteners.

### 7. Indoor Air Quality Requirements

1. Confirm to Division 1 requirements for VOC content.

### 8. Warranty

1. Warrant in accordance with Division 1 requirements.

### 9. Building Systems Requirements

1. The work of this Section is a component of the Interior Finishes Building Systems. Provide the work so that the performance requirements of this system are achieved.

## 2. PRODUCTS

1. Corner Guards (CR)
  1. CS Acrovyn® VA series Corner Guards # A231, colour to Consultant selection. 3" (76mm) by 3" (76mm) 'L' shaped corner guards, minimum 48" (1,220mm) high, rounded corners.
  2. Provide purpose-made end guards (to material, finish as above) to all end walls, and additionally where indicated on drawings. Fabricate with "throat" width to suit assembly thicknesses. Multiple throat widths may be required to suit existing conditions and assembly requirements. Job Check. Back-to-back corner guards are not permitted at such locations.
  3. Location and number of corner guards shall be as per the Architectural Drawings.
2. Chair Rails (CR) – N/A this Project
3. Wall Guards (WG) – N/A this Project

## 3. EXECUTION

1. Verify ALL conditions are ready to receive work. Proceeding with installation applies acceptance of all conditions.
2. Installation of Corner Guards (CG)
  1. Install to number and locations identified on the Architectural Floor Plans, and to ALL outside corners. Install to suit substrates, using adhesive tape fastening.
  2. Do not install corner guards where they will interfere with millwork countertops or other elements that are required to be installed prior to Corner Guards.
3. Installation of Chair Rails (CR)
  1. Install to locations and lengths identified on the Architectural Documents, and install to suit substrates, secured into framing members of assemblies, and for blind methods of fastening to requirements of 062000 and this Section. Install level and true.
  2. Where specific dimensions or lengths are not identified, wall guards shall extend the full width and/or length of walls on which they are located, tight to each return wall or component.
  3. Miter all inside and outside corners, and splice to ensure tightly fitted joinery.
4. Installation of Wall Guards (WG)
  1. Install to number and locations identified on the Architectural Documents, and Install to suit substrates, using adhesive tape fastening methods. Install level and true.
  2. Confirm all locations with Consultant and Owner prior to installation.
5. Clean and protect installation until handover of the Work to the Owner.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division One, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.
2. Portions of the Work of this Section is by material supply cash allowance.

### 2. Related Sections

- |                                       |                          |
|---------------------------------------|--------------------------|
| 1. Cash Allowances                    | Division 01              |
| 2. Existing Conditions & Removals     | Section 024119           |
| 3. Rough Carpentry                    | Section 061000           |
| 4. Finish Carpentry                   | Section 062000           |
| 5. Fire Protection                    | Section 078400           |
| 6. Joint Protection                   | Section 079000           |
| 7. Doors and Frames                   | Section 081113           |
| 8. Hardware to Openings               | Section 087000           |
| 9. Interior Finishes System           | Section 090500           |
| 10. Non-loadbearing Studs & Boardwork | Section 092000           |
| 11. Resilient Flooring                | Section 096500           |
| 12. Painting and Coatings             | Section 099000           |
| 13. Specialties                       | Division 10              |
| 14. Owner Supplied Equipment          | Division 11              |
| 15. Plumbing Fixtures                 | The Mechanical Documents |
| 16. Electrical Devices                | The Electrical Documents |

### 3. Submittals

1. Submit in accordance with Division 01 requirements:
  1. Submit a washroom accessories schedule indicating all accessories to be provided on a room by room basis. Indicate quantity, manufacturer, model, numbers, size and description of components, base material, surface finish inside and out, hardware and locks, attachment devices, description of rough-in-frame and building-in details of anchors for grab bars.
  2. Product Information and Installation Instructions for all washroom and shower accessories supplied by the Contractor, including: installation instructions and recommendations; storage and handling requirements and recommendations; and replacement parts information.

### 4. Co-ordination

1. Co-ordinate with the Owner for scheduling of Owner supplied accessories.
2. Review Schedule of accessories supplied by Owner. Request cut sheets and shop drawings of Owner Supplied accessories from Owner in a timely fashion, so that all service requirements can be provided prior to delivery of items. Owner will make reasonable effort to ensure deliveries at appropriate dates in conjunction with the Schedule.
3. Include delivery of Owner's Accessories on Construction Schedules and co-ordinate the Work to facilitate such supply and installations of same with all trade contractors forming part of the installation work for the item of equipment.

### 5. Quality Assurance

1. Installation work of this section shall be undertaken by finish carpenters acceptable to the Consultant and Owner.

2. The Contractor shall co-ordinate and ensure placement of blocking by rough carpentry, to provide solid support to accessories, as described in Section 061000.
3. To greatest extent possible, provide Products from a single manufacturer except change tables which shall be as specified. All Products shall be from acceptable manufacturers list in this Section.
4. Forces supplying accessories and installing accessories must be fully conversant with present OADA and Building Code standards for mounting and position of all accessories.
6. Basic Executions Requirements
  1. Bring to Owner's attention any damage to supplied items that may affect Product warranty provisions, at time of receipt of Product by Contractor.
  2. It is a performance requirement of this Contract that the installation of all washroom and shower accessories shall be for heavy-duty use, and tamper-proof. The provision of blocking and methods of securement shall be selected and provided to suit such requirements.
7. Warranties
  1. Warrant installation work and sufficiency of blocking for Owner-installed Products in accordance with the Contract General Requirements, GC12.3.1 and 12.3.4.
  2. All Products supplied under this Section shall be warranted directly by manufacturers to the Owner in accordance with GC12.3.6.
  3. Additionally, the Contractor shall warrant the installation of all accessories against failure from their secure positions. The requirements of this spec section are for heavy-duty, tamper-proof installation, and the methods of securement, and the determination of the warranty action, shall be based on such requirements.
8. Maintenance Manuals and Materials
  1. Submit in accordance with Division 1 requirements; and
    1. Provide operation and maintenance data for accessories for incorporation into manual.
    2. Provide all special tools required for accessing, assembly, disassembly or removal for all accessories. Deliver special tools to Owner's representative. Do not under any circumstances leave such items attached to accessories or otherwise left at job site.
9. Identification of Building Systems
  1. The work described by this Section forms components in the following Building Systems as defined in Section 019010. Comply with requirements for the integration of the work described in this Section into its roles in the various systems. Provide the work so that the performance requirements of the overall system of which it forms part is achieved. Trade contractors shall not proceed in uncertainty regarding the role or requirement of the component in relation to the system. Obtain clarification from the Contractor and the Trade Contractor responsible for the system, as set out in Section 019010:
    1. Fire and Smoke Separation Systems, where accessories are installed to assemblies having a smoke and/or fire resistance rating;
    2. Barrier-Free Path-of-Travel System, for mounting heights, clearances and required forces;
    3. Interior Finishes System(s).

## 2. PRODUCTS

### 1. Materials and Products

1. Specified manufacturer's catalogue references below establish the likely standards for the installation Work of this Section. The Owner reserves the right to select alternative manufacturers and Products, and /or multiple Products for specific accessory types.
2. Notwithstanding the above, all accessories shall be heavy-duty type, and tamper-resistant.

### 2. Washroom and Shower Accessories

1. The following washroom and shower accessories shall be Supplied AND Installed this Contract, and not from the Cash Allowance:

#### 1. Coat Hooks (CH):

1. Safety coat hook of brushed stainless steel with maximum 50mm projection, with snap down safety hook. Frost 1150 Safety Hook or equivalent.
2. Provide coat hooks to all locations indicated on drawings, and 2 (two) coat hooks to each barrier-free washroom.

#### 2. Shelf (Barrier-Free):

1. Frost 950-4 18" (460mm) long by 4" (102mm) deep. Install at maximum height of 1,100mm from top of shelf to top of finished floor. Surface mounted, 18 gauge, type 304, 1.2mm stainless steel with 1.6mm stainless steel mounting bracket. All exposed edges to be rolled safety edges.
2. Provide for 2 shelves, to be installed to locations instructed by Consultant.

#### 3. Grab Bars (GB):

1. All grab bars shall be 1 1/2" (38mm) diameter, complete with peened satin finish stainless steel, non-slip grip, with wall flange and covers for concealed mounting and heavy duty anchorage to substrates and blocking.
2. GB-1: shall be 30" (760mm) by 30" (760mm) L-Shaped. Provide 1 (one) each to all barrier-free water closet locations in the Work, and where indicated on drawings.
3. GB-2: shall be 24" (600mm) horizontal grab bar. Provide 1 (one) each to all barrier-free water closet locations in the Work, and where indicated on drawings.
4. GB-3: shall be 30" (760mm) by 40" (1,000mm) L-Shaped grab bar. Provide 1 (one) each to all barrier-free shower locations in the Work, and where indicated on drawings.
5. GB-4: shall be 40" (1,000mm) vertical grab bar. Provide 1 (one) each to all barrier-free shower locations in the Work, and where indicated on drawings.

#### 4. Mirrors:

1. Stainless steel, vandal-resistant mirrors, by Frost no.942SS, or accepted equivalent. Mirrors shall be 18" (457mm) wide by 24" (610mm) high. Provide complete with all fasteners and anchorages. Provide 1 (one) mirror to above all lavatory locations in the Work, whether existing or new.

5. Electric Hand Dryers:
  1. Provided by the Electrical Trade Contractor in accordance with Electrical Documents.
6. Emergency Call Assist System:
  1. Provided by the Electrical Trade Contractor in accordance with Electrical Documents.
  2. Provide 1 (one) complete system each to the barrier-free washroom used by the public adjacent to the main entrance, as well as to the new Universal Washroom to the single occupancy barrier-free shelter room on the Second floor level (Room 231b).
7. Emergency Panic Button and Emergency Sign:
  1. Provide sign posted above the emergency button of the aforementioned call system and in the main corridor, at each location where an Emergency Call Assist System is required (see above), consisting of:
    1. Acrylic Sheet: 6mm thick, polymethyl methacrylate (PMMA) cast sheet suitable for intended use in sign fabrication, transparent clear. Acrylic shall be UV resistant and meet or exceed Code requirements for flammability and flame spread. Provide slightly beveled and polished edges.
    2. Applied Vinyl: 0.05mm pressure-sensitive film designed for permanent graphics. Vinyl letters applied to back of acrylic sheet. White vinyl sheet to be applied to full back of acrylic.
    3. Mounting Hardware: Double-sided tape: 3M VHB 5952 acrylic foam tape.
  2. Sign Text in Universal Washroom shall read: "IN THE EVENT OF AN EMERGENCY, PUSH EMERGENCY BUTTON OR HORIZONTAL PANIC STRIP AND AUDIBLE AND VISUAL SIGNAL WILL ACTIVATE".
  3. Sign Text in Corridors shall read: "THE FLASHING LIGHT INDICATES THAT THERE IS AN EMERGENCY WITHIN THE WASHROOM. CONTACT NFHT STAFF IMMEDIATELY".
  4. Letters to be min. 1" (25mm) high with 5mm stroke. Colour to be selected by the Owner. Sign face shall be minimum 15" (380mm) wide by 12" (300mm) high.
8. Baby Change Table (BCT) -None required this project.
9. Adult Change Table (ACT) - None required this project.
10. Barrier-Free Shower Seat (BFS):
  1. American Specialty (Watrous) Folding Shower Seat 8206, 18" (450mm) wide by 16" (400mm) deep, hinged, not spring-loaded, mounted minimum 460 and maximum 480mm a.f.f., designed to support a minimum 1.3kN load. Refer also to OBC Diagrams for clearances.
  2. Provide 1 (one) to the new single occupant barrier-free shelter room barrier-free washroom on the Second floor level (Room 231b).
11. Recessed Soap Holders (RSH):
  1. American Specialties or equivalent, seamless die-cast construction c/w integral flange, raised lip and drainage channels, purpose-made for wallboard installation, maximum 50mm (2") depth.

2. The following washroom and shower accessories shall be Supplied by the Owner from the Cash Allowances and installed this Contract:
  1. Hand Sanitizer Dispensers (HSD): allow for the installation of 20 (twenty) units throughout the Work, to locations selected by the Owner.
  2. Sanitary Napkin Disposals (SND): 1 (one) adjacent to each water closet in the Work, whether existing or new.
  3. Sharps Disposals Units (SDU): allow for the installation of 30 (thirty) throughout the Work, to locations selected by the Owner.
  4. Waste Receptacle Units (WRU): Floor-mounted, loose units.
  5. Soap Dispensers (SD): install 1 (one) beside each sink or lavatory throughout the work.
  6. Toilet Paper Dispensers (TPD): one (1) adjacent to each water closet (a.k.a. toilet).
  7. Paper Towel Dispensers (PTD): one (1) adjacent to each lavatory, stainless steel sink, hand sink, laundry tub, or similar basins, whether existing or new.
3. Provide for installation of all washroom and shower accessories. Installation is included in the Contract and not the Cash Allowance.
3. Fasteners
  1. Obtain all fasteners for accessories from the supplier of accessories to match the accessory and the specific fastening condition. Robertson head cadmium-coated concealed screws, tamperproof exposed fasteners, exposed fasteners to match holing bevels for face of unit and stainless steel. Costs for all fasteners shall be from the Cash Allowance.
  2. Expansion shields: fibre, lead or rubber as recommended by accessory manufacturer for component and its intended use. Cup washers and/or mismatched fasteners shall not be used. General duty fasteners and fasteners not intended for exposed locations shall not be used. Obtain from accessories supplier in appropriate lengths and finishes for specific conditions.

### 3. EXECUTION

1. General
  1. Fabricate Products in shop only, and ship to site complete. Supply of anchors and fasteners shall meet the requirements of Division 1 Execution, for the specific substrate and conditions for each item. Where anchors and fasteners are supplied generically, they shall not be acceptable for use in this Project. All fastening and anchoring shall be purpose-designed and concealed completely in the finished work, able to withstand the conditions of service that can be reasonably expected in the Facility.
  2. Supply Products and materials to site and store in compliance with manufacturer's instructions. Protect all accessories and do not install until adjacent work has been completed and accepted.
  3. Photograph the roughed in blocking and elevations of all walls and ceilings at the rough-in stage, to record presence of blocking. Call for Consultant review of blocking once completed and prior to covering.
  4. Supply inserts & rough-in frames at appropriate time for building-in. Provide templates, details and instructions for building in anchors & inserts for each condition in the Work.
  5. Install all accessories.

2. Installation

1. Install and secure accessories rigidly in place as follows:

1. Stud walls: install nominal 2x (38mm) thick back-plate to studs prior to plaster or board finish. Ply blocking not acceptable.
2. Hollow masonry units: use toggle bolts drilled into cavity.
3. Masonry, marble, stone or tile: use bolt with lead expansion sleeve set into drilled hole.
4. Grab Bars: fasteners to suit specific substrate and as procured by Contractor from supplier of grab bars to develop resistance to standards of the OBC and authorities having jurisdiction. Backing must be nominal 2 by 12 blocking securely fastened to each adjacent stud with minimum 4 (four) 3" (75mm) nails through stud into blocking. Ply not acceptable.

2. Do not install accessories until layout has been established and temporarily marked on wall for approval of building inspector and Owner. Where accessories must be relocated to suit Owner or Barrier-Free provisions after installation, replace all holed tile.

3. Install accessories plumb, level, and true, and in accordance with manufacturer's shop drawing and reviewed and accepted Submittals. Set recessed and semi-recessed accessories in bedding surround with kitchen-grade silicone sealant to quality requirements of Section 079000. Remove excess sealant to form concealed seal.

4. Installation includes the following:

1. Verify blocking has been installed properly.
2. Verify location does not interfere with door swings or use of fixtures.
3. Comply with manufacturer's recommendations for backing and proper support, where more stringent than this Section.
4. Use fasteners and anchors suitable for substrate and project conditions, to acceptance of Consultant.
5. Conceal evidence of drilling, cutting, and fitting to room finish.
6. Test for proper operation.

3. Maintenance Materials

1. Provide special keys or tools required for operation of accessories, with spare sets, directly to Owner's representative and obtain receipt. Tools and keys "left in [or top of] the accessory" are not acceptable, and shall be promptly replaced at Contractor's cost.

4. Cleaning

1. Clean all accessories.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division One, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.

### 2. Related Requirements

- |  |                |
|--|----------------|
| 1. Rough Carpentry                     | Section 061000 |
| 2. Finish Carpentry                    | Section 062000 |
| 3. Joint Protection                    | Section 079000 |
| 4. Interior Finishes System            | Section 090500 |
| 5. Non-Loadbearing Studs and Boardwork | Section 092000 |
| 6. Floor Finishes                      | Division 10    |
| 7. Paintings and Coatings              | Section 099000 |
| 8. Toilet and Shower Partition         | Section 102100 |

### 3. Submittals

1. Submit data in accordance with Division 1 requirements and:

1. Shop drawings including all product information, and complete dimensioned layouts for all lockers. Establish clear dimensions that incorporate ceramic tile floor and adjacent wall work. Provide all locker layouts, material thicknesses, construction, details, drawings and shop detail drawings for the work described by this Section.
2. Submit duplicate samples of colour to confirm selection.
3. Submit operation and maintenance data in accordance with requirements of Division 1. Include description of maintenance, adjustments, and part list for replacements.

### 4. Quality Assurance

1. Work of this Section shall be performed by a finish carpentry trade contractor accepted by the manufacturer. Upon Consultant or Owner request, submit evidence of such acceptance.

### 5. Warranties

1. Warrant in accordance with Division 01 requirements and GC12.3.1 and 12.3.4 and further:

1. Manufacturer warrants Products provided under this Section against peeling, warping, failure, defect, or breakage that is not directly attributed to wilful damage, for replacement of Product, for 5 (five) years following Substantial Performance of the Work. The manufacturer shall further warrant Product in accordance with GC12.3.6, directly to the Owner.

### 6. Building Systems Requirements

1. The work described by this Section is a component of the Interior Finishes Building Systems. Comply with requirements for the integration of the work described in this Section into its roles in the various systems. Provide the work so that the performance requirements of the overall system of which it forms part is achieved.

## 2. PRODUCTS

1. Standard of Acceptance: Hadrian Emperor Lockers or equivalent meeting ALL requirements of this specification section.

2. Alternative Manufacturers: Equivalent systems meeting requirements outlined above by Scranton, GSS, Global or ASI Watrous in steel are acceptable for use in this Contract.
3. Locker Units
  1. Steel heavy-duty construction, single tier doors, 16 gauge heavy-duty piano hinged doors, 18" nominal (457mm) width by 24" (610mm) depth by 72" (1,830mm) height, and complete with angles tops, base pedestals, anti-graffiti powder-coat finish, prepared for padlock security locking, and as follows:
    1. Include all fabricated items necessary for banks of units to layouts shown.
    2. Include all fillers, fittings and hardware with stainless steel Torx head specific to the installation and substrates for this Contract. Rivet construction is preferred where exposed in the finished work.
    3. Provide 1 (one) fixed clothes hanger bar to each lockers, to full width of locker.
    4. Provide 3 (three) fixed shelves to each locker.
    5. Locker numbering system shall be to Owner's Selection at Submission stage, white text on black background.
    6. Fit lockers systems with noise reduction bumpers to all closure sides of the door openings.
    7. Finish: powder-coated, colour from standard colour range to Consultant selection at Submission stage. Note that different colour may be selected for frames and locker doors.
    8. Provide matching wall closure trim where installed adjacent return walls
    9. Provide sloped top for all banks of lockers, typical all lockers.
  2. In areas with banks of 4 (four) lockers width of lockers to be reduced to 15" (375mm).

### 3. EXECUTION

1. Preparations
  1. Take onsite measurements after erection of work upon which the work of this Section depends. Inspect for levels and ensure allowances for floor falls, and final thicknesses of tile and other finish installations.
  2. Do not commence installation until all other finishes are in place and have been accepted by the Owner and Consultant. Coordinate installation with finish work and accessories installations described in Section 062000.
2. Installation
  1. Install lockers in rigid, substantially braced and anchored fashion, level, plumb, and true, with uniform gaps between doors, pilasters, and panels not to exceed 3mm. Install to manufacturer's written instructions for all specific conditions.
  2. Keep onsite drilling and fitting to a minimum.
  3. Adjust function of all operating hardware for best fit and function.
  4. Replace damaged units, panels, doors, or other lockers components howsoever caused, at no cost to the Owner, promptly upon notification by Consultant of defects or deficiencies.
3. Clean up
  1. Clean and protect installation until handover of the Work to the Owner.

### END OF SECTION

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.

### 2. Related Requirements

- |                                     |                          |
|-------------------------------------|--------------------------|
| 1. Work to Existing Building        | Division 01              |
| 2. Removals                         | Section 024119           |
| 3. Concrete                         | Division 03              |
| 4. Masonry                          | Division 04              |
| 5. Rough Carpentry                  | Section 061000           |
| 6. Finish Carpentry                 | Section 062000           |
| 7. Millwork                         | Section 064000           |
| 8. Solid Surface Fabrications       | Section 066100           |
| 9. Fire and Smoke Protection        | Section 078400           |
| 10. Interior Finishes System        | Section 090500           |
| 11. Interior Finishes               | Division 09              |
| 12. Installation of Building Signs  | Section 101400           |
| 13. Washroom and Shower Accessories | Section 102800           |
| 14. Plumbing Systems                | Divisions 20 & 22        |
| 15. HVAC Exhaust Systems            | Divisions 20 & 23        |
| 16. Electrical Power and Devices    | see Electrical Documents |
| 17. Communications Systems          | Section 270500           |
| 18. Security Systems                | Section 280500           |

### 3. Co-ordination

1. Co-ordinate with the Owner's forces for scheduling of Owner's supplied items.
2. Request cuts and shop drawings from Owner in a timely fashion, so that all service requirements can be provided prior to delivery of items. Owner will make reasonable effort to ensure deliveries at appropriate dates in conjunction with the Schedule.
3. Include delivery of Owner's Equipment on Construction Schedules and co-ordinate the Work to facilitate such supply and installations of same with all trade contractors forming part of the installation work for the item of equipment.

### 4. Warranties

1. Warrant in accordance with Division 1 requirements:
  1. All installation work.
  2. Bring to Owner's attention any damage to supplied items that may affect Product warranty provisions, at time of receipt of Product by Contractor.
  3. All direct plumbing connections, warranted in accordance with Section 200500, and to the applicable conditions required of plumbing systems, against leaks.
  4. All direct electrical connections, warranted in accordance with Section 260500, and to the applicable conditions required of electrical distribution systems, against loss of power, shortage or other damage to equipment caused by faulty installation.

## 5. Identification of Building Systems

1. The work described by this Section forms components in the following Building Systems as defined in Section 019010. Comply with requirements for the integration of the work described in this Section into its roles in the various systems. Provide the work so that the performance requirements of the overall system of which it forms part is achieved. Trade contractors shall not proceed in uncertainty regarding the role or requirement of the component in relation to the system. Obtain clarification from the Contractor and the Trade Contractor responsible for the system, as set out in Section 019010:
  1. Emergency Egress System;
  2. Barrier-Free Path of Travel System, for mounting heights, clearances to/from equipment and devices, and clear approach spaces;
  3. Building Structural System, for support of equipment to framing and structure;
  4. Interior Finish System, for all items exposed to view in the finished work, and for neat and clean appearance of any routing;
  5. Sanitary Sewerage System, for indirect connections to sanitary piping;
  6. Air Distribution System, for connection of equipment to exhaust ductwork;
  7. Communications Systems, for Owner Supply of WIFI AP devices;

## 2. PRODUCTS

### 1. Items Supplied by Owner

1. The Owner shall supply for installation by the Contractor, including but not limited to:
  1. Building Signage supplied by Cash Allowance, as described in Section 101400;
  2. Washroom Accessories supplied by Cash Allowance as described in Section 102800;
  3. Washer and Dryer Equipment, as supplied by the Owner, for connection to Wall Boxes and exhaust ductwork and vents;
  4. Chemical Detergent Dispensing Equipment, as supplied by the Owner; for coordination of electrical receptacles for such equipment, and for fire-stopping of all penetrations of dispensing system piping;
  5. New Kitchen Equipment, as supplied by the Owner;
  6. Further items as described on Equipment Schedules in the Drawings.
2. For each item, take delivery of items at edge of delivery truck, handle and transport to place of installation, all in accordance with the definition of "install" in Division 1. Protect and store items in accordance with Division 1 requirements until installation.
3. All appliances shall be Supplied by Owner and installed by Owner's forces. Co-operate completely with such forces. Installations will occur after Substantial Performance and acceptance of the facility by the Owner. Co-ordinate any deficiency work remaining at that time to ensure that Owner's installations can proceed permanently and without disruption.

### **3. EXECUTION**

1. This Contractor shall obtain information for Owner-supplied products from Owner's suppliers in due time to co-ordinate any rough-in requirements. Confirm height, location, and size of units with authorities having jurisdiction and the Owner. Do not rely upon drawings for final location of units.
2. Install owner-supplied products to locations, directed by Owner using further materials and methods necessary for suspension and securement at no additional cost to Owner.
3. Install all products listed in this Section to satisfaction of the Owner. Provide all connection work for equipment involving mechanical or electrical systems.
4. Ensure work over equipment locations is complete, and no further access is required.
5. Ensure floors are sealed and finished a minimum 24 hours prior to delivery and installation.
6. Cooperate with Owner's forces for installation of furnishings immediately following completion of areas for turn over to the Owner's use and enjoyment.
7. Cooperate with Owner's forces for installation of equipment control wiring, datacom equipment, security equipment, and communications and security lines and devices immediately following completion of areas for turn over to the Owner's use.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division One, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.

### 2. Related Requirements

- |  |                |
|--|----------------|
| 1. Existing Conditions                 | Division 01    |
| 2. Selective Demolition                | Section 024119 |
| 3. Rough Carpentry                     | Section 061000 |
| 4. Finish Carpentry                    | Section 062000 |
| 5. Architectural Woodwork              | Section 064000 |
| 6. Windows                             | Division 08    |
| 7. Interior Finishing System           | Section 090500 |
| 8. Non-Loadbearing Studs and Boardwork | Section 092000 |
| 9. Painting & Coating                  | Section 099000 |

### 3. Quality Assurance

1. Installer shall use forces in the direct employ or under the control of the system manufacturer, skilled, trained and experienced in work of similar scope and complexity of work specified herein, with minimum 2 (two) years experience for the work superintendent.

### 4. Submittals

1. Submit in accordance with Division 1 requirements:
  1. Detailed shop drawings showing configurations, materials, finishes, methods of operation, joint locations and method of joining, anchorage details, fastening, and connections.
  2. A complete Schedule of window shades indicating dimensions of all units.
  3. Submit duplicate samples of all fabrics, and unit finishes.
  4. Submit test results showing conformance of fabric with OBC requirements for flame spread and smoke development characteristics for commercial and institutional use.

### 5. Warranty

1. Warrant in accordance with Division 1, and:
  1. The Contractor and Supplier of roller shades shall warrant the work of this Section for three (3) years.
  2. The Supplier and manufacturer of the Products supplied to the Work as described by this Section shall further warranty all Product directly to the Owner in accordance with manufacturer's warranty.

### 6. Maintenance Manuals and Materials

1. Provide operation and maintenance data in accordance with the requirements of Division 1. Include description of maintenance, repairs, and part list for replacements.

### 7. Indoor Air Quality Requirements

1. Requirements for VOC and other characteristics for Products and materials specified in this Section are additionally specified in Section 018080, Indoor Air Quality. Products must conform to these requirements.

## 8. Identification of Building Systems

1. The work described by this Section forms components in the following Building Systems as defined in Section 019010. Comply with requirements for the integration of the work described in this Section into its roles in the various systems. Provide the work so that the performance requirements of the overall system of which it forms part is achieved. Trade contractors shall not proceed in uncertainty regarding the role or requirement of the component in relation to the system. Obtain clarification from the Contractor and the Trade Contractor responsible for the system, as set out in Section 019010:
  1. Barrier-free path-of-travel system
  2. Fire and Smoke Control Systems
  3. Interior Finishes System

## 2. PRODUCTS

### 1. Roller Shades:

1. The system shall be a roller system utilizing a bi-directional, wrap-spring clutch. The system must be capable of smoothly raising and lowering the shade to any desired height, and maintaining that height with zero slippage.
  1. The systems must be electrically operated where indicated on drawings,
  2. The systems must be spring-pull chain-less operation in all shelter sleeping rooms and all window shades located on the second floor, the third floor, and in all transitional housing apartment units,
  3. otherwise chain-operated.
2. The clutch and automatic operating assembly must be provided to never require any adjustment, either upon installation or afterwards. Clutch may be mounted in either end of the roller tube. The clutch shall be made of high-strength fibreglass reinforced polyester and high carbon steel.
3. Chain operating loops – on all non-sleeping room windows - shall be qualified No. 10 nickel-plated steel ball chain, with upper and lower stops and an average tensile strength of 45 pounds.
4. Universal mounting brackets, capable of mounting inside, outside or to the ceiling, with the clutch on either the right or left end of the roller. All brackets shall be made of .060" plated steel.
5. The roller tube shall be sufficient diameter and wall thickness to prevent excessive deflection along its length, and shall have an adhesive strip applied for attaching the fabric. The fabric shall be attached to the tube with an adhesive strip. A minimum of one turn of fabric must be placed on the roller before the working section of fabric starts.
6. Shade Fabric
  1. Shade fabric shall hang flat, without buckling or distortion.
  2. Fabric edge, when trimmed shall hang straight without raveling.
  3. An unguided roller shade cloth shall roll true and straight, without shifting sideways more than 3mm in either direction due to warp, distortion or weave design.
  4. Fabric shall pass "Small Scale Vertical Burn Test" in accordance w CAN/ULC-S109-M87.
  5. Provide an exposed anodized aluminium hem bottom bar.
  6. Meeting requirements of Ontario Building Code for Flame Spread rating and smoke development classification for the building use and construction.
7. Standard of acceptance
  1. Sol-R roller blind system as supplied by ProMark. Contact Brad Schaefer at 226-898-3059.

2. Roller shades shall be to AAM12 C22 A31, clear anodized aluminium valence, simple hem aluminium bottom bar, clear stoppers and clips for chain mounting, protection sleeves to chains. Fabric shall be Cebo 3% openness (35% polyester, 65% PVC, 16oz per square yard, 0.025" thickness), colour to Owner's selection from standard colour ranges. Where black out is scheduled in conjunction with regular 3% shades, blackout screen shall be independently controlled. Shades may be ceiling or wall-mounted, to suit site conditions.
  3. All shades to shelter sleeping rooms shall be chainless operation.
9. Acceptable Alternatives
1. Alternative Manufacturers of window shades may only be considered during the bidding period, and as meeting the requirements of this Section.

### 3. EXECUTION

1. Preparations
  1. Take onsite measurements after erection of work upon which the work of this Section depends. Inspect for levels and ensure allowances for window openings, ceiling and sill heights, and final thicknesses of other finish installations.
  2. Do not install work described by this Section, until immediately prior to occupancy and acceptance of the Work by the Owner. All window and sill work, all touch-ups and deficiencies in painting and finish work must be completed to the acceptance of the Consultant for all areas near the installation of window shades.
2. Fabrication and Installation
  1. Refer to drawings for windows to receive roller shades.
  2. Fabricate and install work of this Section square, plumb, and true, in required configurations and locations, securely anchored to supporting work.
  3. Blackout systems shall meet the acceptance of the Owner. Revise, re-install, or replace at no cost to the Owner where blackout of the space or area is not achieved.
  4. Perform all preparatory work to accept the shade products.
  5. Accept delivery and install the units to their final position.
  6. Test operation of each unit and, if necessary, make adjustments to ensure proper operation.
3. Inspection and Clean up
  1. Clean and protect installation until handover of the Work to the Owner. Keep shades in the recessed position.
  2. The only trade contractor or workman that shall operate blinds, drapery, or shades once installed and adjusted is the Window Covering Trade Contractor. No exceptions.
  3. Replace all damaged units complete, howsoever damage is caused. Pay all costs for replacement. Replacement of damaged units and malfunctioning units shall be at no further expense to the Owner.

### END OF SECTION

## 1. GENERAL

### 1. General Requirements

1. Comply with Division One, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.

### 2. Related Requirements

- |  |                |
|--|----------------|
| 1. Selective Demolition                | Section 024119 |
| 2. Finish Carpentry                    | Section 062000 |
| 3. Steel Doors and Frames              | Section 081113 |
| 4. Windows                             | Division 08    |
| 5. Glazing                             | Section 088000 |
| 6. Interior Finishing System           | Section 090500 |
| 7. Non-Loadbearing Studs and Boardwork | Section 092000 |
| 8. Painting & Coating                  | Section 099000 |
| 9. Building Signage                    | Section 104000 |
| 10. Window Shades                      | Section 125000 |

### 3. Quality Assurance

1. Installer qualifications: skilled, trained and experienced in work of similar scope and complexity of work specified herein, with minimum 2 (two) years experience.

### 4. Submittals

1. Submit in accordance with Division 1 requirements:

1. Product Information for all window films.
2. Samples of all window films.

### 5. Warranty

1. Warrant in accordance with Division 1 and:

1. Supplier of window films shall warrant the work of this Section, to be free from defects in material and manufacture for a period of five (5) years,
2. Installer of window films shall additionally warrant the work of this Section, from loss of adhesion from glass surfaces, bubbling, curling, or similar other defect, for a period of 2 (two) years.

### 6. Maintenance Manuals and Materials

1. Provide maintenance data in accordance with the requirements of Division 1. Include instructions for replacement and/or repairs.

### 7. Indoor Air Quality Requirements

1. Requirements for VOC and other characteristics for Products and materials specified in this Section are additionally specified in Division 01. Products must conform to these requirements.

### 8. Identification of Building Systems

1. The work described by this Section forms components in the Interior Finishes Building System, as defined in Section 019010. Comply with requirements for the integration of the work described in this Section. Provide the work so that the performance requirements of the overall system of which it forms part is achieved.

## **2. PRODUCTS**

### **1. Privacy Control Films**

1. Standard of Acceptance shall be 3M™ Fasara™ “Glaze” Interior Design Films c/w acrylic pressure sensitive adhesive backing and wet application: polyester; matte translucent finish; Visible Light Transmittance 56%; Visible Light Reflectance 18%; 2.76 mil thickness.
2. Alternative products will only be considered during the Bid period.

## **3. EXECUTION**

### **1. Preparations**

1. Take onsite measurements of work upon which the work of this Section depends. Inspect for levels and ensure allowances for window openings, ceiling and sill heights, and final thicknesses of other finish installations.
2. Do not install work described by this Section until immediately prior to occupancy and acceptance of the Work by the Owner. All touch-ups and deficiencies in painting and finish work must be completed to Consultant acceptance for all areas near the installation of films.

### **2. Installation of Glass Films**

1. Install Privacy Control Films where indicated on drawings, and to all side lites, upper lites, and lower lites in existing exterior openings. Install to the interior side of glazing.
2. Install films free of joints, to full widths and heights of glazed area. Job check all dimensions of existing windows.
3. Ensure all glass surfaces are clean and free of all dust, particulate, oils, and other deleterious substances, prior to commencement of film installation. Commencement of film installation shall be deemed as this Trade's acceptance of all glass surfaces.
4. Ensure complete adhesion to glass surfaces, free of bubbling, curling

### **3. Inspection and Clean up**

1. Clean and protect installation until handover of the Work to the Owner.
2. Replace all damaged films complete, howsoever damage is caused. Pay all costs for replacement. Replacement shall be at no further expense to the Owner.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated herein.
2. The Mechanical Trade Contractor (as Subcontractor to the Contractor) shall contract for all portions of the Work (the Mechanical Part of the Work) as follows:
  1. all Mechanical Systems, including work that relies upon descriptions of materials, methods, or quality set out in other specification Divisions which are referenced therein;
  2. indicated on the mechanical drawings and schedules, and
  3. all related work and services as set out or referenced in Division 1 General Requirements, and the Conditions of the Contract, as they may affect the Mechanical Part of the Work.
3. The Mechanical Trade Contractor shall organize and accept bids for aspects of the Mechanical Part of the Work from Suppliers and Subcontractors as set out in these specifications, and shall be fully responsible for the Mechanical Part of the Work, including all such Subcontracts and Supply Contracts. Any variance from the assignment of responsibilities within the Mechanical Trade Contractor's chosen methods of subcontracting and/or organizing of the Mechanical Part of the Work shall not relieve the Mechanical Trade Contractor of any responsibility set out anywhere in the Contract Documents that is assigned to it. More particularly:
  1. Testing and Balancing work shall be by an accepted independent testing and balancing firm acceptable to the Owner and as listed in Section 200850, with demonstrated experience in working with public emergency services projects. See list of qualified firms.
4. The work and services described by this Section and its further references are required by the Contract and shall govern all sections of Divisions 20, 21, 22, 23, and 25 (hereinafter "the Mechanical Divisions") as if repeated therein.
5. The Contractor and all Trade Contractors and all bidders shall carefully inspect all sections and divisions of the bid forms, the specification in its entirety, and the drawings, and any addenda to ensure that work described in this section and this division of the specification is understood together with all related items required by the Contract. Requirements for this inspection are set out in Division 1 as well as the General and Supplementary Conditions of the Contract.
6. The Contractor and all bidders in the contract bidding hierarchy shall solicit and determine the potential and intention for its Subcontractors and Suppliers to in turn provide bids to it for aspects of the Work, and shall provide a lead letter to them outlining the method and manner of the division of the Work as proposed, including requirements for the work schedule. All costs, organization and timing of the aspects of the Work required to achieve the contract schedule are included in the Contract Amount.
7. All bidding Trade Contractor Subcontractors and Suppliers shall review the bid forms well prior to bid closing, and shall provide information to the bidding General Contractor to enable the bidding General Contractor to complete bid forms with all required bid information in a timely manner.
8. Comply with the bidding provisions for bidding, inclusion of taxes, examination of existing conditions and reference documents and bidding procedures. This information is set out in Division 0 of the specifications.
9. Definitions and general contract procedures are described in the Articles, Definitions, General Conditions, Supplementary Conditions, Section 002000 Existing Conditions, and Division 1 of the specification.
10. Additional requirements may be specified on drawings or in specification sections. Comply with the most stringent requirements wherever stated or reasonably implied.

11. Organization of the Documents

1. Nothing in the organization of the Tender & Contract Documents shall imply a division of the construction and related services that are required by the Contract into separate units of work or subcontracts unless specifically so stated. The Contractor shall perform the Work as one integral construction and shall arrange for division of the Work to best ensure timely performance by qualified workmanship as per Division 1 of the Specification.
  2. The technical sections of this Division are artificially divided into sections for ready reference purposes only. The Consultant shall not act as an arbiter or establish the division of requirements of the Contract into units or Subcontracts of any kind unless such division is specifically so stated. Particular specification sections of this Division shall always be read within the context and requirements of the General Requirements of this Division, which shall always be read within the context and requirements of Division 1, and in turn within the general terms and conditions of the Contract.
  3. In general, and without limiting specific requirements stated elsewhere, the construction and related services described in this Division shall be understood within the context of specific Building Systems as defined and set out in Division 1. Responsibility for the achievement of contract requirements with respect to each Building System is the Contractor's, and are in turn further and additionally assigned by the Contractor to specific trade contractors as set out in the Documents.
  4. The Contractor, all bidders, and the trade contractors shall carefully review the requirements for Building Systems performance, construction, and related services as set out in the Contract, and shall include all costs to perform the Work to these requirements.
  5. Drawings for Building Systems are schematic diagrams only, and do not govern the amount of work, organization, design, Product, or material required to achieve conformance with Contract requirements.
12. Mention in the specification or notation or indication on Drawings of products, materials, operations or methods means the Contract requires:
1. Supply of each item mentioned or indicated, to exceed specification provisions for quality, and subject to any particulars or qualifications noted;
  2. Installation according to conditions stated or inferable and as required to contribute to the Building Systems of which it forms part:
  3. Successful provision of performance requirements of the components and the Building Systems of which it forms part, for each operation or method prescribed or anticipated by the design; and
  4. The finished Work, with the furnishing of all necessary labour, equipment, and incidentals to achieve the above.
13. Where used, words "Section" and "Division" shall be deemed to mean the Contractor and the particular Trade Contractor or Subcontractor who shall provide the work of this Contract or such aspect of the work to make the Building System, finished work and site complete in all respects, and achieve system performance.
14. "Supply" is defined in Section 016010, Basic Product Requirements.
15. "Install" is defined in Section 017010, Basic Execution Requirements.
16. "Provide" means to supply and install.
17. "Exposed" means work normally visible, including work in equipment rooms and similar spaces

18. *"finished area"* means any area or part of an area which receives an in-situ finish or factory finish.
  19. *"governing authority"* and/or *"regulatory authority"* and/or *"Municipal authority"* – means all government departments, agencies, standards, rules and regulations that apply to and govern the electrical work and to which the work must adhere
  20. *"O&M"* – means Operating and Maintenance
  21. Where used, wordings such as "as directed, permitted, permission, accepted, acceptance, report to", shall mean "by Consultant" in each case.
2. Existing Conditions
    1. All bidders shall visit the place of the Work and examine in detail the existing conditions as set out in Section 002000, the documents in their entirety, and the place of the Work prior to submitting an offer for the Work or any of its aspects. No additional costs will be considered by the Owner for conditions and requirements that are reasonably inferable as necessary for the Work from such examination of the Place of the Work, existing building or existing Building Systems, including within accessible portions of existing ceiling spaces and service spaces.
    2. Requirements for this inspection are set out in Division 1 as well as the General and Supplementary Conditions of the Contract.
    3. No additional claims or costs will be accepted after tender and contract award because of claimed unfamiliarity with existing systems or conditions.
    4. Existing Building Systems at the Place of the Work must be maintained until new systems or changes to systems are functional and accepted by the Owner in accordance with the Contract, unless written permission is given by the Owner for early decommissioning of such systems.
3. Abbreviations
    1. Many words or expressions that are repeated frequently on the drawings or within the specifications are abbreviated to reduce the amount of wording that might obscure the detailing. To avoid misinterpretation, these abbreviations are listed, with their full meaning, in Section 011090 and elsewhere in the documents using legends and notes.
    2. The Consultant's interpretation of the meaning or intent of an abbreviation shall be consistent with the intent of the Contract, but such finding shall be final. In all cases where meaning is not immediately clear, or is capable of varying interpretation, contact the Consultant for clarification before proceeding with the aspect of the Work affected.
4. Special Project Requirements
    1. General requirements for accommodating the ongoing operation of the construction, for hoarding and security, for products likely to off-gas during and subsequent to their installation, and construction sequencing requirements are set out in the architectural drawing set, in the Owner's Operations, Safety, and Security Conditions, and in Section 011020 and elsewhere in Division 1 for Indoor Air Quality and building flush-out. Trade Contractors shall adhere to these requirements in strict cooperation with the Contractor. Co-ordination of costs for these requirements shall be clearly set out by the Trade Contractor and Contractor in their agreement. No additional costs will be accepted by the Owner for the failure of the Contractor, a Trade Contractor Subcontractor, or Supplier to incorporate these contract requirements into its bidding or performance of its aspect of the Work.
    2. Contractors are also hereby notified that all work must be performed so that Owner's subsequent maintenance is in accordance with the regulations of authorities regarding workplace safety and the use of ladders in the everyday maintenance of Building Systems. Mechanical elements requiring maintenance shall be placed accessibly, so that the Owner's ladders and work platforms can be used to safely perform regular maintenance requirements.

3. Trade Contractors are hereby notified that this Contract includes the performance of aspects of the Work within the occupied Owner's facilities and the new addition to facilitate the construction sequence. Cooperate fully with the Contractor for the organization and performance of such aspects of Work, including off-hours work, multiple mobilization and return of work areas for the Owner's daytime use, special provisions for temporary systems to ensure Owner's use of systems is not interrupted, and other measures all as reasonably required to minimize the Owner's inconvenience and disruption of existing operations.
4. The Work must be performed in accordance with requirements for behaviour, decorum, and workplace culture as set out in Division 1.
5. Schedule of Values, Allowances, Claims for Payment, Changes in the Work
  1. All construction and related services within the Work has monetary value, which shall be itemized in the Contract Schedule of Values. No certification of value can be provided by the Consultant where an aspect of the Work is not performed. Trade Contractors shall co-operate with the Contractor in providing a full and complete breakdown of the Work in accordance with Section 012010, which shall govern as if repeated here.
  2. Cash and Contingency Allowances are described in Section 012010 of the specification.
  3. The intent of this specification is that all allowances shall be carried by the Contractor, not by individual Trade Contractors or Subcontractors. Contractor shall read entire specification prior to bidding and shall include in Stipulated Price Contract Sum, all allowances called for in this or any Section of Specifications or drawings. If allowances specified herein are repeated in other Sections, or if allowances are specified in other Sections but not listed in this Section, Subcontractors and Contractors are requested to inform Consultant immediately in order that action may be commenced to implement the express intent that all allowances be carried by the Contractor only.
  4. Claims for payment shall be made in accordance with Section 012030. Trade Contractors shall provide all information necessary for the Contractor to fully account for all portions of claims for payment.
  5. **Requirements for the valuation of changes in the Work are set out in Section 012040. The mechanical trade contractor shall provide pricing for changes in accordance with the Mechanical Contractors Association of America (MCAA) Labor Estimating Manual, latest published version, at base rates without inclusion for inefficiencies or job conditions unless with the consent of the Consultant, less 25%.**
6. Project Meetings
  1. Requirements for project meetings during the construction period are described in Section 013010 of the specification.
  2. Trade Contractor participation and attendance at Pre-construction, Progress, Pre-Takeover, and Post-Construction Meetings is required. Trade Contractor representatives attending such meetings shall be the authorized representatives assigned responsibility for Building Systems and commissioning as set out in Sections 018010 and 019010.
  3. The Contractor and Trade Subcontractors shall hold regular Interference and Co-ordination meetings to ensure the timely and proper co-ordination of the Work. The Contractor shall submit proceedings of such meetings to the Consultant within four business days of such meeting.
  4. The Contractor, the Mechanical Trade Contractor, and his Trade Contractors shall schedule and hold a meeting with the Consultant during initial phases of project start-up to review and consider the means and methods proposed by the Contractor for installation of the systems, and to ensure that the location, intent, and requirements of the systems are clearly understood by the Contractor and trade contractors who will perform the work.

## 7. Construction Schedules

1. The requirements for the scheduling of construction, and the requirements for submitted schedules relating to the timing of submissions, cash flow, and product delivery are described in Section 013020 of the specification.
2. No additional claims or costs will be accepted after tender and contract award because of claimed unfamiliarity with the Contractor's proposed schedule, including off-hours, holiday, and overtime work required to meet such schedule, by any Trade Contractor or Supplier.
3. All Trade Contractors shall solicit and obtain the Contractor's proposed schedule and organization of the Work prior to submitting a bid for the Work. Include all costs relating to such scheduling.
4. All Trade Contractors shall provide services required to review, prepare, and update the schedules required for submission to the Consultant as set out in Division 1.

## 8. Submittals

1. General requirements and procedures for preparation, inspection and certification, and provision of all submittals is described and referenced in Section 013030. All Trade Contractors and the Contractor shall adhere to the requirements set out in that Section, and elsewhere within the Contract Documents, in providing submittals and shop drawings that are required anywhere in the Contract Documents.
2. Review of Submittals and Shop Drawings by the Consultant and/or Owner is for the sole purpose of ascertaining conformance with the general design concept. This review shall not mean that Consultant accepts detail design inherent in Submittals and Shop Drawings, responsibility for which shall remain with the Contractor and Trade Subcontractors and Suppliers as applicable, and such review shall not relieve the Contractor, trade Subcontractors, and Suppliers of responsibility for errors or omissions in the submittals and shop drawings or of responsibility for meeting all requirements of Contract Documents.

The Contractor is responsible for dimensions of equipment to be confirmed and correlated at site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of work of all trades. Trade Subcontractors shall cooperate in such co-ordination and shall provide information accurately and completely in a timely manner to achieve Contract Requirements.

3. Provide for all submittals for the Mechanical Part of the Work, and:

1. Sleeving Drawings:

To clearly and accurately determine the exact location, elevation and size of any and all formed holes, recesses and sleeving required to either existing conditions or new work. Provide a copy of accepted sleeving drawings to the reinforcement detailer well in advance of planned precast concrete fabrication, concrete pours and masonry construction. Design sleeves to allow for movement of element penetrated.

2. Access Door Drawings:

To clearly and accurately set out location, elevation and sizes of all access doors required to either existing conditions or new work. Provide a copy of the accepted access drawings to the appropriate installation trades well in advance of need.

3. Interference Drawings:

To clearly and accurately set out and interrelate the location, elevation and size of all crossings and relationships among existing conditions and all building services required in the work wherever such relationships may be problematic.

Coordinate service location, routing and arrangement with existing conditions, work described by this Division, and work described elsewhere in the Documents. Provide copies of the drawings to the appropriate installation trades well in advance of need. Drawings shall also show inserts, special hangers and other features to indicate routing through concealed spaces, installation of coils, silencers and other such items in such confined areas.

4. Detail Drawings:

To clearly set out and interrelate all existing conditions and new work in shafts, mechanical equipment areas and rooms, service rooms and utility rooms. Base layouts on accepted Submittals and Shop Drawings and include, but do not necessarily limit to, details pertaining to access, clearances, tappings, sleeves, electrical connections, drains, service spaces and clearances for services and removals of components, and integral control drawings.

5. Component Building Systems Diagrams:

Of each specific mechanical Building System. Provide diagrams to reference and relate all component wiring and control mechanisms, and clearly establish control wiring and other control connections among the system components, both internal and external, for review and coordination of trades. Ensure that the diagrams clearly and separately demonstrate the methods of control that will achieve operation and performance of each and every sequence of control and each operating condition required of the system or to which the system shall be exposed in its service life. Ensure that all inputs and outputs to and from the Building System for existing elements and other systems are specifically shown and listed together with all requirements for such elements external to the system. Distribute the diagrams to related Trade Contractors and obtain acceptance and certification by Building System commissioners to which they relate, as set out in Division 1.

6. Composite Building System Diagrams:

Of each specific component of mechanical Building Systems operated by electrical or mechanical means. Indicate all wiring and operable mechanisms, both internal and external, for review and coordination of trades. Distribute to related Trade Contractors and obtain acceptance and certification of the diagrams by the Building System commissioning representatives to which they relate, as set out in Division 1.

4. Contractor's Material and Test Certificates: Prepare and submit such certificates for each Building System. Where certificates are prescribed by regulations, codes or standards ensure they conform to the requirements of those documents. Include a copy of each certificate in the Operation and Maintenance Manual. Certificates shall include, but are not limited to the following:
1. Description of the system;
  2. Description of all tests conducted and results observed, including re-testing;
  3. Description of any corrective measures undertaken;
  4. Description of materials used;
  5. List of witnesses for each test conducted;
  6. Date system left ready for service; and
  7. Signature of installing Trade Contractor and Building Systems Commissioning representative as set out in Division 1.
5. Submit in accordance with Division 1 requirements, and for each mechanical Building System, the following:
1. a list of all products and materials complete with manufacturer and product numbers for Contractor's Material and Test Certificates;

2. photographic documentation of new portion of system, and existing systems affected by the work described in this Section that will not be exposed in the finished Work;
  3. as-built and record drawings in accordance with Division 1 requirements;
  4. records of tests and certifications of the system at rough-in and completion;
  5. record of acceptance of the system by authorities having jurisdiction;
  6. copies of all material and test certificates, system inspection reports, tests including failed tests, preliminary and final balancing reports, and certification of system to meet codes and regulations;
  7. copies of factory tests for all equipment;
  8. copies of all maintenance information and recommended spare parts lists for equipment;
  9. manufacturer, product, and system warranties, in accordance with Division 1.
6. Submit a list of proposed nameplates for acceptance before manufacturing.
9. Coordination
1. General requirements and procedures for co-ordination and layout of the Work, of its component parts, its relation to conditions and utilities whether existing or new, and whether provided under this Contract or by authority or utility, and for cutting and patching, is described and referenced in Section 013050. All Trade Contractors and the Contractor shall adhere to the requirements set out in that Section, and elsewhere within the Contract Documents, in co-ordinating the parts of the construction and services that are required anywhere in the Contract Documents, and in performing the work described therein.
  2. Perform the total construction and related services so that requirements for cutting and alteration of existing elements and new construction are eliminated wherever possible. Where not possible, perform cutting and patching using trades fully qualified in the installation of the material being cut. Trade Contractors installing the item requiring to pass through do not perform the cutting and patching, although the cost of such cutting and patching shall be borne by that Trade Contractor.
  3. The sequence of installation of Building Systems shall be planned by the Contractor and all Trade Contractors to facilitate the performance of the systems and the achievement of the design intent. The Contractor and all Trade Contractors shall take special care in the planning of the Contractor's sequences of installation that the inherent requirements of Building Systems dependent upon gravity, head pressure, or similar factors shall be installed early in the construction sequence to ensure that such performance is optimized.
  4. The order of precedence of Building Systems for the purposes of co-ordinating the installation shall be as described in Section 019010, and generally as follows:
    1. Building Structural System takes precedence over,
    2. location of exposed devices and building elements in architectural elements such as ceilings, over
    3. location of systems in exposed architectural locations over,
    4. location of non-pressurised liquid systems functioning by gravity, over
    5. pressurised liquid systems requiring maintenance drainage, over
    6. pressurised air distribution systems, over
    7. pressurised liquid and gas systems, over
    8. electrical distribution systems.
  5. Mechanical Drawings do not show structural, architectural, and related details. Take information involving accurate measurement of building from building drawing notations, and also at building from existing conditions.
  6. Furnish "built in" items in ample time and give necessary information and assistance in connection with building in of same. Notify Trade Contractor concerned in writing of size and location of recesses, openings and chases at least 48 hours before walls are erected, floors poured and similar work.

7. Where not sleeved, make holes through steel, concrete walls, floors and elements by hole drilling and concrete core drilling only. Verify location of structural reinforcing and concealed conduit and systems using appropriate methods such as x-ray, and obtain Consultant's acceptance before drilling. Under no circumstances core drill existing or new structural steel, pre-cast, pre- or post-tensioned concrete structure without written acceptance of the Consultant for each individual location. Obtain a professional engineer's review and acceptance at no cost to Owner upon request of Consultant.

10. Reference Standards and Codes

1. The relation of the Work to Reference Standards and Codes is described in the General Conditions and Supplementary Conditions of the Contract, in Section 014020, and elsewhere in the Contract Documents.
2. Conform to the contract requirements, regulations, and legislation of authorities having jurisdiction, as in force where the Work is located, meeting the more stringent requirement in each situation.
3. Apply for, obtain, and pay for all permits and inspections required by authorities having jurisdiction including mechanical permits, excepting the municipal building permit only.
4. Furnish necessary certificates as evidence that work installed conforms with laws and regulations of authorities having jurisdiction. Work to meet such requirements is required by the Contract and included in the Contract Amount and Contract Time.
5. Conform to the recommendations of the organizations listed in Section 014020 for good practice. Use standards and codes referenced wherever in the Contract, in whole or in part, in their most recently revised or amended form, as specifically requested in the Specification and as applicable in normal industry practice:
  1. to the performance of the Work,
  2. to the interrelation of Products and their components,
  3. to the installation of such Products and execution of related services.
6. Equipment, materials, and workmanship provided under this Division shall conform to applicable standards and regulations of the following organizations:
  1. Ontario Building Code
  2. Ontario Fire Code
  3. CAN/CSA-B52 Mechanical Refrigeration Code
  4. CAN/CSA-B149.1 Natural Gas and Propane Installation Code
  5. Canadian Heating, Ventilating and Air Conditioning Code
  6. N.F.P.A. Standards
  7. American Society of Heating, Refrigeration and Air Conditioning Engineers
  8. Ontario Gas Utilization Code.
  9. Local Codes, Standards and Bylaws
  10. Ontario Ministry of Environment and Climate Change
  11. Technical Standards and Safety Authority (TSSA)
  12. Ministry of Health
  13. Boards, Services, Companies, and other Authorities having Jurisdiction
  14. Mechanical Contractors Association of America (MCAA)
7. Minor changes required by an authority having jurisdiction shall be carried out without change to the Contract Amount. Standards established by drawings and specifications shall not be reduced by applicable codes or regulations.
8. File Contract Drawings with proper authorities and obtain their approval of installation and permits for same before proceeding with work. Prepare and submit necessary detailed shop drawings as required by Authorities.

9. Pay all fees in connection with examination of drawings, permits, inspections and final certificate of approval by Authorities with jurisdiction over the Mechanical Part of the Work.

#### 11. Quality Control

1. General requirements for quality control are described in Section 014050. Workmanship and method of installation shall conform to best standards and practice and be performed to acceptance. Work shall be done by tradesmen skilled in the aspect of the work they perform. Where required by local or other By Laws and Regulations or the Contract, tradesmen shall be licensed in their trade. Install all work and equipment to manufacturer's written directions for this specific contract.
  1. Trade workers shall have a Certificate of Qualification as Journeyman or Apprentice Registration for the Place of the Work or an Interprovincial Certificate
  2. Ratio of journeyman to apprentice: not to exceed ratio in Apprenticeship Act of Ontario.
  3. Certificates and Registration must be provided to the Consultant on request.
  4. Maintain on-site an up-to-date record listing journeyman and apprentices working on site.
2. The Contractor, on request, will supply Trade Contractors with necessary levels and dimensions that are required to relate work described in this Division. Maintain all lines and levels so given.
3. Tolerances for the installation of the Work are defined and set out in Section 014050 as well as elsewhere in the Documents and as established by manufacturers and suppliers of Products. Conform to the most stringent requirements.
4. Temporary or trial usage of any device, machinery, apparatus, equipment, system, or materials shall not be construed as evidence of acceptance of same by either Consultant or Owner. No claim for damage shall be made for injury to or breaking of any part of such work that may be so used. The Contractor remains responsible for all elements of the construction until final acceptance of the Work in its entirety.
5. Provide testing of components and systems wherever required by the Consultant, by applicable law, code or regulation, by authorities having jurisdiction, and where stated in the Documents. This includes factory and off-site testing as well as at the Place of the Work.
6. Submit in accordance with general provisions all written record reports of all tests and of all certificates from independent agents certifying compliance and acceptance, including preliminary reports and reports involving failed tests.
7. Rough copies of test reports must be submitted by facsimile to the Consultant within 3 business days of date of test. Final issued copies of test reports must be submitted within 14 days of date of test. Work upon which the tested component or system depends, and work to cover such systems or components, proceeds at the Contractor's and applicable Trade Contractors sole risk until review and acceptance of successful test certifications and reports by the Consultant.

#### 12. Temporary Facilities

1. Temporary measures, required environments, and facilities for the performance of the Work are described in Sections 015010 and 015033. Conform to such requirements. The Contractor shall ensure such conformance and shall provide such measures and co-ordinate responsibility for such requirements among Contractor and Trade Contractors.
2. Each Trade Contractor is responsible to create suitable working environment for its workers and the products and materials being installed, and for protection of such products and materials prior and after installation until final acceptance of the Work, unless specific arrangements for such protection and environments have been made with the Contractor.

3. Temporary measures required by this Contract include provision of dust closures to open ends of all ductwork at all times during the course of the Work, except time of actual installation, and to all grilles and diffusers. Remove such protection only at system commissioning, and with the acceptance of the Owner. Ensure all such protection is removed prior to balancing of systems and inspect all ceiling spaces to ensure removal of such closures prior to handover of the Work.
4. Provide temporary office, workshop and tools and material storage space as necessary for the for the mechanical work and assume responsibility for any loss or damage thereto. Buildings erected for this purpose shall conform in appearance to those erected for similar purposes under other Divisions of Specification.
5. Provide scaffolding and shoring necessary for work of this and other Mechanical Divisions. Scaffolding and shoring shall be adequate to protect the workmen according to Provincial and Local Regulations.
6. Provide rigging and millwrighting, labour and equipment necessary for the work of this and other Mechanical Divisions. Employ only workmen well experienced and skilled in such trades for this portion of the work.
7. Provide hoisting machinery, operators, labour and materials necessary to lift and place equipment supplied under this and other Mechanical Divisions.
8. The permanent systems or any part thereof shall not be used during construction for construction purposes, unless so permitted by the Owner in writing.

#### 13. Safety Requirements

1. General requirements for safety are described in the General Conditions and Supplementary Conditions of the Contract, and in Sections 200500.
2. Specific requirements for safety and operations in relation to existing conditions and the Owner's operations and facility are described in Section 002000 and reference documentation.
3. Conform in all respects to the requirements for safety described in the Contract Documents, and applicable legislation and regulations referenced therein.
4. Provide on all corners and edges of equipment, ductwork piping, hangers and obstructions mounted less than 2 m above floor in mechanical or similar rooms, suitable pre-manufactured and purpose designed protective edge guards to protect persons from injury.

#### 14. Environmental Protection

1. Measures and facilities for the protection of the environment during performance of the Work are described in Section 015060. Conform to such requirements. The Contractor shall ensure such conformance and shall provide such measures and co-ordinate responsibility for such requirements among Contractor and Trade Contractors.

#### 15. Basic Product Requirements

1. Requirements for Products and supply of Products is described in Section 016010. Conform strictly to such requirements.
2. All equipment, controllers, and systems must restart automatically upon re-activation of electrical power, following power failure, and resume their sequence of operation without manual intervention.

3. Alternatives & Substitutions

1. Throughout the Mechanical Documents, are lists of alternative manufacturers acceptable to the Consultant & Owner. These manufacturers have been deemed to have the ability to supply materials and product that meets the characteristics of the specified or described product or material item. Such products or materials may need to be customized or otherwise worked to achieve the characteristics required by the design and the Contract. The Contractor is cautioned that neither the Owner nor Consultant have made extensive investigation of the particular material or product characteristics of alternative manufacture to ensure that such products or materials meet the requirements of the Contract.
2. Each Bidder may elect to use alternative products or materials from such lists, providing that the bidder investigate and determine any required changes or customization of the product or material necessary to ensure the performance of the Building Systems of which it forms part, its interrelationship with adjacent components, and achievement of the contract requirements.
3. The Contractor and the Trade Contractor responsible for the Building System in which a product or material is to be installed shall ensure alternative products fit space allotted, provides all specified features, and gives performance specified. If an alternate product or material is proposed by the Contractor or Trade Contractor and does not fit space allotted nor is equivalent to the specified product in Consultant's opinion, regardless that the manufacturer has been nominated as an accepted alternative manufacturer, supply of the specified described product will be required without change in Contract Amount or Contract Time. Only manufacturers stated as specified or as acceptable alternative will be accepted for the bidding of the Contract. All other manufacturers shall be quoted as a Bidder's Alternative on the tender bid forms in accordance with provisions within the bid forms, accompanied by requested information and stating conditions and credit amount that may be applied to the Bid Price upon acceptance of the alternative by the Owner.
4. If a product or material specified or described is unobtainable to meet Contract Time and Construction Schedule requirements, the use of a proposed substitute product or material shall be shown on the Bidder's Alternative section of the bid forms, together with an amount added or deducted from the Bid Price for its use. Extra monies will not be paid for substitutions after Contract has been awarded.
5. If an item of a size or weight or capacity required by the Contract is unobtainable to meet Contract Time and Construction Schedule requirements, supply next larger size or capacity or heavier weight without additional cost to the Owner.

16. Basic Execution Requirements

1. The general requirements for execution of the Work are described in Section 017010.
2. Each Trade Contractor shall:
  1. Co-ordinate the execution and layout of his work and be responsible for any damage caused to other Trade Contractors or Owner by improper location or carrying out of same.
  2. Be responsible for prompt installation of work in advance of other portions of the Work upon which the Trade Contractor's work depends and to facilitate diligent and orderly progress of the Work.
  3. Protect all finished and unfinished work and existing conditions from potential damage by performance of work described in this Division. Co-ordinate protection with Contractor.
  4. Be responsible for condition of material and equipment supplied. Be responsible for protection and maintenance of work completed until termination and acceptance.

3. **Mechanical Drawings are diagrams, and do not show the integrated construction required by the Contract. Take information involving accurate measurement of conditions from noted measurements on all Contract drawings, and at the Place of the Work, and verify all dimensions prior to performing work upon which such dimensions depend, wherever located. Make, without additional charge, any necessary changes or additions to runs of piping, conduits and ducts to accommodate existing conditions and the requirements of other parts of the Work. Route systems for best appearance, neat and straight in conformance with structural and architectural elements. Location of pipes, ducts, conduits and other equipment may be altered by the Consultant without extra charge provided change is made before installation and does not necessitate major additional material. Do not scale drawings.**
4. As work progresses and before installing finish devices and elements of systems such as heating units, registers, diffusers, fixtures and other fittings and equipment that may interfere with interior treatment and use of building, obtain detailed instructions for exact location of such equipment and fitments. Ensure that installation of finish devices and equipment is performed upon completion and acceptance of surrounding finished elements.
5. Mechanical Drawings indicate general location and route of pipes, ducts and conduits that are to be installed. Where required work is not shown or only shown diagrammatically, install same to conserve headroom (minimum 7'-3" or 2,200 mm clear) and interfere as little as possible with free use of space through which they pass. Conceal piping, conduits and ducts in furred spaces, ceilings and walls unless specifically shown otherwise. Install work close to structure so furring will be small as practical. Maintain minimum 24" (600mm) service space around serviceable units and as required for maintenance access and replacement of internal components.
6. Install piping and ductwork to clear structural members and any fireproofing or rated assemblies that are to be applied to such members. Locate mechanical work to permit installation of specified insulation. Do not remove or damage structural fireproofing or protections. Suspended elements or units of other construction shall not be obstructed from easy removal by interfering pipes, ducts, conduits or any other obstruction below the units.
7. Before commencing work, check and verify all sizes, locations, grade and invert elevations, levels and dimensions to ensure proper and correct installation. Verify exterior municipal services.
8. Locate all mechanical and electrical equipment in such a manner as to facilitate easy and safe access to and maintenance and replacement of any part.
9. In every place where there is indicated space reserved for future or other equipment, leave such space clear, and install piping and other work so that necessary installation and connections can be made for any such apparatus. Obtain instructions whenever necessary for this purpose. Do not proceed in uncertainty.
10. Relocate equipment and/or material installed but not coordinated with work of other Sections as directed, without change in the Contract Amount or Time.
11. All components of equipment must be installed for easy service access. Consult with Consultant if intended design layout has to be modified to maintain service access shown on manufacturer's instructions or drawing details for component installation. As described elsewhere in this Section, co-ordination and planning of layouts, together with submittals and review of all conditions of the Work is a requirement of this Contract.
12. Securely plug or cap open ends of electrical raceways or equipment to prevent entry of dirt, dust, debris, water, snow or ice. Clean all equipment inside and outside before testing.
13. Equipment stored on site shall be protected from weather and kept dry and clean at all times. Take care to avoid corrosion of metal parts.
14. Protect work installed from damage. Secure all unfinished or loose work to prevent movement.

#### 17. Cleaning and Construction Waste Management

1. Requirements for cleaning and the management of construction waste and recyclable materials during the progress of the Work and at the various stages of final completion of the Work are described in Section 017040 and 017042.
2. Without exception and in addition to any requirements of the Contractor, each Trade Contractor is responsible for cleaning the Place of the Work on a daily basis to ensure that all effects of its construction operations and execution of the aspect of the work for which the Trade Contractor is responsible achieve the orderliness and cleanliness of the Place of the Work required at the end of each working day. Each day, Trade Contractors shall remove from the Place of the Work surplus materials and debris resulting from the Trade's activities. Keep work areas clean and in a workmanlike manner at all times to acceptance of the Contractor, Consultant and Owner.
3. The Consultant may issue instructions to the Contractor to clean or manage waste and recyclables in accordance with Contract requirements whenever deemed necessary, including for special cleaning by outside cleaning forces at Trade Contractor expense.
4. Immediately prior to completion of work:
  1. Remove all dust, dirt and other foreign matter from internal surfaces of equipment.
  2. Remove all temporary protective coverings and coatings, temporary labels.
  3. Clean, repair, lubricate and adjust all mechanism and moveable parts of apparatus and equipment leaving it in new condition and operating properly.

#### 18. Commissioning

1. Start-up, commissioning, and final commissioning are defined terms within this Contract, as described in Section 018010. No industry practice or common understanding shall detract from the definition of these terms as set out therein. The Contract requires that each Building System be overseen by a System Commissioner, who shall be an authorized representative of the trade contractor responsible for the system. The System Commissioner shall perform all functions as assigned in Division 01, working in cooperation with the Contractor's Commissioning Co-ordinator.
2. The Contractor and all Trade Contractors shall start up components, perform commissioning of systems, and perform final commissioning of systems as described in Section 018010 and elsewhere in the Contract Documents for particular systems, including all aspects of these operations. Where these operations are not performed to the satisfaction of the Consultant, by his sole criteria and judgment, perform or re-perform these requirements at no additional cost to the Owner as many times as instructed and as necessary to achieve the complete commissioning intent of each system and other systems upon which the system depends.
3. Commission HVAC equipment and systems through all cycles and seasons.
4. Instruct Owner's Building Operators in repair, maintenance and operation of the systems and associated equipment.
5. Arrange for on-site instruction by any product manufacturers where considered necessary by Consultant, or requested in the Contract Documents, at no additional cost to Owner.
6. Systems, equipment, and all major items of material shall be tested to the satisfaction of the Consultant, and as required to establish compliance with plans and specifications, and with the requirements for the Supply and Inspection Authorities.
7. Faulty and defective equipment shall be replaced with new materials.
8. Provide all work for equipment start-up, system start-up, commissioning, and final commissioning of Building Systems described in this Division, in accordance with requirements described in Division 1.

9. Arrange for additional on-site instruction by various manufacturers where considered necessary by Consultant, at no additional cost to Owner.
  10. Trial usage of any equipment or materials shall not be construed as evidence of acceptance of same and no claim for damage shall be made for injury to or breaking of any part of such work which may be so used.
  11. Provide all work for equipment start-up, system start-up, commissioning, and final commissioning of building systems described in the Mechanical Part of the Work, in accordance with requirements described in Division 1.
  12. The Mechanical Trade Contractor shall carry in their bid the cost for all performance testing of equipment and systems. This includes all equipment, labour, instruments, expenses of the manufacturer's representative, and incidentals, and all power and fuel.
  13. Submit record of all tests and have these tests signed by Owner's Commissioning Witness, Contractor's Superintendent and, where applicable the manufacturer's representative.
  14. Submit certification letters from the manufacturers of all equipment certifying that their technical representatives have inspected and tested their equipment and are satisfied with the methods of installation and operation. Where existing systems are extended and or modified, provide letters covering both new and existing equipment and connections. These letters shall state the names of persons present at testing, methods used and a list of functions performed with location and room numbers where applicable.
  15. Arrange for on-site instruction by various Manufacturers where considered necessary by Consultant, at no additional cost to Owner.
19. Contract Closeout
1. Requirements and definitions for identification of defects and deficiencies, correction of same, Substantial Performance of the Work, and Completion of the Contract are described in Section 017070. The Contractor and all trade contractors shall conform to these requirements in all respects.
  2. The Contractor, and more particularly the Trade Contractors performing work to Building Systems described by this Division, are cautioned that accomplishment of the Work involves both construction and related services. The related services have monetary value within the contract amount, and failure to perform related services in a timely manner to facilitate completion of the Work shall result in a finding of defective work by the Consultant, with related deduction of such monies from the Contract Amount.
  3. Application for final review will be considered when the Work has been completed and written declarations submitted that all commissioning, testing adjustment, set up and documentation is complete. Consultant's final review shall be done when:
    1. All reported deficiencies have been corrected.
    2. All systems have been balanced, tested, commissioned and are operational.
    3. The Owner has been instructed in the operation and maintenance of all equipment.
    4. All reports have been submitted and reviewed.
    5. All maintenance manuals have been submitted and reviewed.
    6. All tags and nameplates are in place and all data submitted and reviewed.
    7. Cleaning up is finished in all respects.
    8. All certificates are furnished.
    9. All spare parts and replacement parts specified have been provided.
    10. All record drawings have been submitted and reviewed.

## 20. Record Documents

1. The general requirements for photographic record of the installation of the Work, as-built drawings, and record drawings are described in Section 018040. Conform to these requirements.
2. Independently of the Contractor and the documents required by Section 018040, the Mechanical Trade Contractor shall obtain and pay for at least 2 (two) sets of black-line white-prints upon which to clearly mark locations and installation of the systems as work progresses, changes and deviations from piping, ducts and equipment shown so that on completion Owner and Consultant will have records of exact location of these components. Locate exterior buried work by dimension from building including final top and invert elevations. Submit as-built drawings to the Contractor for inspection and acceptance prior to creating record drawings of the Building Systems, and prior to application for substantial performance.
3. The Contractor shall ensure that as-built information is accurately recorded and shall check same as the work progresses. As-Built drawings shall be reviewed with Consultant at each job-site meeting.
4. Record Documents shall include the following information in addition to requirements set out elsewhere:
  1. Inverts of all services entering and leaving the Tenant Demised Spaces, and or where they connect to existing Landlord services.
  2. Dimensions of underground services shall be in relation to the building.
  3. Elevations of underground services in relation to ground floor level of the building.
  4. Location of all services embedded in the structure, utilizing references to existing structure.
  5. All changes to the Work due to Change Orders and Site Instructions.
  6. All changes to the Work during construction.
  7. All changes to architectural elements that affect the backgrounds of this record set.
5. Upon completion of Contract Work, prior to Substantial Performance inspection and after final review with Consultants, all Trade Contractors shall, in cooperation with the Contractor, neatly transfer recorded information and make final record submission to Consultant in the following form:
  1. One (1) set of clean, legible prints.
  2. In the form of electronic CAD drawings as set out in Section 018040.
6. Consultants shall review As-Built information provided by Contractor. Revise drawings to suit any comments until acceptable for submission to Owner.

## 21. Warranties

1. The Contractor and all Trade Contractors are specifically cautioned that all warranties relating to products and execution shall be in accordance with Section 017080. All warranties shall commence from the date of Substantial Performance of the Work, or the formal acceptance by the Consultant and Owner of the complete Building System of which a product or component forms part, regardless of the start-up date of such item, whichever is later.
2. The Contractor and all Trade contractors shall collect from their SubContractors and Suppliers all Guarantees/Warranties specified in the Contract Documents, in the form specified, and in addition all standard warranties offered by product manufacturer's whether specified or not. The Contractor and all Trade Contractors are specifically cautioned that the proper provision of warranties is required by the related services noted in Contract Close-out above.
3. The Contractor and each trade contractor assigned responsibility for a Building System shall provide a one year warranty to the Owner for the specific Building System, in accordance with the General Conditions of the Contract, as modified by the Supplementary Conditions.

## 22. Maintenance Manuals and Materials

1. The general requirements for the organization, formatting, and contents of Maintenance Manuals and the provision of maintenance materials is described in Section 018060.
2. All Trade Contractors are responsible for collecting completing all submittals, shop drawings, instructions, data, operating instructions, trouble-shooting instructions, parts list, parts diagrams, evidence of all tests, maintenance manuals, valve tags and similar directories, balancing reports, and any other information requested in the Contract Documents, to assist the Contractor in assembling this information in neat manuals.
3. The Contractor shall be under no obligation to forward monies certified by the Consultant for the progress draw immediately prior to Substantial Completion, or for Substantial Completion, where a Trade Contractor is substantially deficient in the performance of duties related to warranties, manuals, and submittals.
4. Additional Requirements for the Mechanical Maintenance Manuals (see also Division 1)
  1. The manuals shall include complete operating instructions, installation, cleaning and lubricating procedures, preventative maintenance procedures etc., for each piece of equipment or system installed under the Mechanical Divisions. This information, instructions, and similar data, shall be prepared by the individual equipment manufacturer and as supplement by the manufacturer's designer if, and when, necessary.
  2. The manuals shall include a general arrangement of shop drawings, detailed drawings, applicable operating curves, etc. A complete parts list of assemblies and component parts for all equipment shall be provided, and shall include a recommended spare parts list, quantities, etc., showing the manufacturers name, catalogue number and closest supplier.
  3. All data supplied shall be pertinent to the specifics of the equipment installed and shall not be considered acceptable if the data is of a general nature.
  4. Within the period prior to acceptance of the Work, the Owner's personnel shall be instructed in the proper operation and maintenance of the systems and equipment installed. The instruction period shall be of sufficient duration to fully familiarize the operating personnel with the systems and equipment. The Owner's personnel shall be instructed in all aspects of the systems and equipment being accepted. The Contractor and Trade Contractors shall include all costs for such instruction to the satisfaction of the Owner, without limitation.

## 23. Contract Requirements for Building Systems

1. Definitions:
  1. *Control*: For clarity, the definition of control is referenced herein, as set out in Section 019010, Building Systems Requirements. In summary, control means a method by which a component of a Building System is instructed to perform the operations and functions to fulfil the requirements and intent of the Building System. All systems require control as an integral part of the Work and contract requirements. Controls shall have a similar meaning.  
  
A Building Monitoring System (BMS) is only one aspect of the control requirements for Building Systems, and in the case of this contract there is a BMS system. Responsibility for all control requirements resides within particular Building Systems work. Provide all control instruction within the systems themselves at no cost to Owner.
2. Provide all materials, products, work and services required to achieve the design intent and standards for detailed design, procedures, Products, systems, and execution of the Building System as it can reasonably be inferred from the Contract Documents, including its proper and co-ordinated relation to other Systems, at no additional cost to the Owner.

3. Building Systems requirements are further described in Section 019010, together with assignment of responsibility for Building Systems to the Contractor and specific Trade Contractors. Trade Contractors performing work described in this Division shall perform all obligations for Building Systems as assigned. All Trade Contractors shall carefully inspect these requirements, and shall incorporate all such requirements into their work, price, and contractual obligations with the Contractor.
4. The Contractor and trade contractors are specifically cautioned that the contract requires detailed design, layout, and co-ordination services to ensure that the performance intent of the design prepared by the Consultant is achieved in the finished Work for each and all Building Systems. This requirement has monetary value as part of the Contract Amount. Failure to perform this requirement shall result in a reduction of the contract amount as found by the Consultant, regardless of the performance of other required aspects of the Contract.
5. The Contractor and each trade contractor assigned responsibility for a Building System shall provide a one year warranty to the Owner for the specific Building System, in accordance with the General Conditions of the Contract, as modified by the Supplementary Conditions.
6. Drawings for Building Systems are schematic diagrams only, and do not govern the amount of work, product, or material required to achieve conformance with Contract requirements.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with the requirements of Section 200500, Mechanical General Requirements, as if repeated herein.

### 2. Building System Requirements and Sequence of Operation

1. Provide all materials, products, work and services required to achieve the design intent and standards for detailed design, procedures, Products, systems, and execution of the Building System as it can reasonably be inferred from the Contract Documents, including its proper and co-ordinated relation to other Systems, at no additional cost to the Owner.
2. Comply with the requirements of Section 200500 and Section 019010, and requirements set out for particular Building Systems in the Specification.
3. The Contractor and all Trade Contractors are specifically cautioned that the Contract requires work and services to achieve the performance and intent of the Building Systems identified in Division 1 of the Specification, including but not limited to emergency egress systems, fire separation systems, barrier free access systems, and other systems that are created or altered by the finished Work.

### 3. Testing and Commissioning of Systems

1. Provide all materials, products, work and services required to balance, test, and adjust Building Systems to achieve specified performance, at no additional cost to the Owner.
2. Commissioning requirements are described in Section 200500 and Division 1 of this specification, as well as in particular sections for each Building System.

## 2. PRODUCTS AND EXECUTION

### 1. General Materials

1. Materials for this Contract shall be of high quality of their respective kinds and of uniform pattern throughout, in accordance with the requirements of Section 016010 and as further specified or noted for specific materials and products.
2. Install all materials and products to Consultants acceptance and requirements of Section 017010 and as further specified or noted for specific materials and products.
3. Install all materials and products parallel to building lines, whether exposed in the finished Work or not. Obtain clarification and acceptance of proposed routing of systems from Consultant. Do not proceed in uncertainty.

### 2. Excavation and Backfilling

1. Perform excavation and backfilling work to the requirements described in Section 312300 of the specification as if repeated herein.
2. All required excavation and backfilling for the Mechanical Part of the Work, excepting only site mechanical work shown on Site drawings, shall be provided by the Mechanical Trade Contractor using trained and qualified personnel and equipment as an integral part of the mechanical subcontract. Unless specific written agreements have been made between the Mechanical Trade Contractor and the Contractor regarding each location and requirement for such aspect of the Work to some other contractual arrangement, the Work shall be bid and performed on this basis.

3. The excavation and backfill includes removal of finished surface, and work to locate and avoid all existing services that may be present at the place of the installation.
3. Roof Penetrations, Flashings, Envelope Penetrations, and Penetrations of Wall, Floor, or Ceiling Assemblies, Penetrations of Members, Cutting and Patching
  1. All roof and exterior envelope penetration work, including holing and sleeving of foundations, shall conform to the requirements described in Division 7 as if repeated herein.
  2. In general, the Trade Contractor responsible for the item penetrating the assembly shall supply the appropriate roof drain, stack, cone, sleeve, or flashing to a size to suit. The Contractor and the Trade Contractor shall co-ordinate the size and location of all such items, taking due regard for required clearances among the various elements and requirements for insulation surrounding the element and its connection to the Exterior Envelope System components. The Roofing Trade Contractor shall install such items as an integral part of the roofing work. The Mechanical Trade Contractor shall engage and pay the Roofing Trade Contractor for building in, and for any cutting and patching of the roof to suit the electrical requirements. For wall and foundation penetrations of the Exterior Envelope System, the Mechanical Trade Contractor shall engage and pay the Contractor for the installation of the items unless other arrangements have been formally accepted during the bidding period.
  3. Notwithstanding any payment arrangements, the Mechanical Trade Contractor shall not install components that are to be built in, or cut and patched, to the Environmental Separation System, to masonry, or to structural members including hollow core precast concrete. Such work must be performed by the Trade Contractor or Contractor responsible for the performance of the Envelope System, the mason, or the installer of the structural component, in each case.
  4. Where drawings detail typical penetrations, supply the items in accordance with such details, as modified to suit particular penetration sizes and configurations.
  5. The Mechanical Trade Contractor shall make contractual arrangements and pay for holing to deck, foundation walls, and other assemblies to allow the passage of his portion of the Work. Requirements for cutting and patching are further described in Division 1.
  6. Where vents, stacks or other pipes or mechanical items pass through roof, supply Thaler insulated "Stack Jacks" spun aluminium flashings and telescopic cap, or equivalent by accepted manufacturer.
  7. Where mechanical equipment is roof mounted, the Mechanical Trade Contractor shall supply suitable pre-fabricated heavy gauge galvanized steel curb, min. 18" (450 mm) high and further as necessary to achieve min 300 clearance from top of curb to top of roofing membrane, unless drawings detail otherwise for integrated sleepers to the roof system or unless vibration isolation is required by this specification. Where mounting curbs and bases, or equipment sleepers are detailed on drawings, supply curbs and bases in accordance with such details. The Trade Contractor providing such equipment shall assess the potential for each item of equipment to produce and transmit vibrations and sound from its operation, and where such potential may exist shall obtain written instruction from the equipment manufacturer for isolation of the equipment. The Trade Contractor shall supply and install this suitable isolation, in accordance with manufacturer's instructions, at no cost to the Owner.
  8. All bases and curbs shall account for falls to structure and to roofing at the particular location of the installation, and shall be supplied to ensure a horizontal and level mounting for equipment, and to facilitate vertical orientation of penetrations, without shimming.
  9. Mounting of equipment on precast concrete pavers shall only be acceptable where specifically noted or detailed on drawings. In such cases the Trade Contractor providing the equipment shall supply and install such pavers to effectively distribute the weight of the equipment from its points of bearing to the roof surface. Minimum thickness of paver shall be 65 mm., and minimum number of pavers shall be 4 for all equipment with dead weight of 220 lb. (100 kg.) or less, with 2 additional pavers for each additional 110 lb. (50 kg.) together with galvanized steel

sleepers to effectively distribute the equipment weight evenly to such pavers. Fasten equipment securely to sleepers.

#### 4. Vibration Isolation Requirements

1. Ensure that the vibration induced by mechanical Building Systems and their components does not result in any sound level in excess of the levels as defined in the ASHRAE Guide and Data Book, and does not result in physical discomfort to the occupants as solely determined by the Owner.
2. Vibration control devices are required by this Contract where Building System components are installed in the following areas, where such components may induce sound levels and/or discomfort as stated above:
  1. Service Rooms, Mechanical and Electrical Rooms that border on regularly occupied areas or rooms of the building or site,
  2. Rooftop areas and for rooftop equipment over occupied areas of the building,
  3. Ceiling and other concealed service spaces,
  4. Component locations bordering conference rooms, classrooms, and private offices are deemed by the Owner to be ultra-critical and this Contract requires vibration isolation to mitigate the risk of component vibration in any Building System within or adjacent such spaces.
3. All vibration isolation required to meet the referenced ASHRAE standards shall be selected and supplied from a single supplier and co-ordinated by the Contractor among the Electrical and Mechanical Trade Contractors immediately upon award of Contract. The following are acceptable suppliers of isolation systems:
  1. Vibron
  2. Vibro-Acoustics
  3. Kinetics Noise Control
  4. Mason
4. Vibration isolation devices shall be of the spring type, the particular type being determined by the supplier's assessment of both the vibrating component and the nature of the supporting substrate. The Supplier shall submit a written assessment for each location, component, and condition, for the review and acceptance of the Consultant and Owner.
5. The supplier of vibration isolation devices and system shall submit shop drawings for the Consultant's review and acceptance. The drawings shall show the following for each item and location of isolation:
  1. general layout and location of all components requiring isolation,
  2. equipment weights, characteristics, and disturbing frequencies as assessed,
  3. structural base design where applicable,
  4. number of isolators, selection data, static deflection at actual load and resultant isolation frequency,
  5. details of isolation including diameter and length of springs, housing material and levelling device.
6. The supplier of vibration isolation devices shall direct and supervise the installation of the isolation devices and system.
7. Finishes for isolation components for indoor use shall be one coat of zinc chromate primer and two coats of finish paint to meet requirements of Section 099000, colour bright orange. For exterior locations provide neoprene coated steel or stainless steel springs and finish other components in accordance with field painting requirements for exterior locations as set out in Section 099000.

8. Electrical connections to components mounted for isolation of vibration shall be flexible and looped one turn. Mechanical connections shall be provided with flexible hose to piping, canvas connections to ductwork, and other isolating connections as suitable for the component being connected.
  9. Where mounts to the isolation system are fastened to adjacent substrates, use vibration isolation washers to prevent short circuiting.
5. Painting and Identification Marking
1. All non-factory painting and applied finish coatings, whether site or shop applied, shall conform to the requirements described in Division 9 as if repeated herein, and additionally as described herein.
  2. In general, all operating devices and equipment shall be supplied with factory-applied finish coatings as installed and warranted by the manufacturer. Choice of colour shall be by Consultant from standard offered ranges of colour from the manufacturer.
  3. Supply all equipment and materials fabricated from iron or steel (except piping and ductwork materials) prime painted at factory before shipment. Minimum quality of primer, wherever installed, shall be as described in Division 9 for the specific material noted. If primer is damaged or the unit requires alteration for holing in shop or site, the Trade Contractor shall touch up with primers to match factory-priming and leave ready for painting. All auxiliary support steel described in Divisions 20 and elsewhere on Mechanical Specifications on Drawings, on on Drawings, shall be supplied by the Mechanical trade Contractor to the standards described in Division 5 for Miscellaneous Metal Fabrications, together with prime finishes identified therein.
  4. Where not factory-finished by a manufacturer, all metal parts, miscellaneous metal items and work installed exterior to building must be degreased and prime painted unless G90 or Z275 galvanised. Wipe-coat galvanizing or standard duct galvanizing is not acceptable except where such item is scheduled in the Contract Documents to receive site finish priming and painting.
  5. Finish painting of bare piping, ductwork, insulation and unfinished surfaces of equipment is described in Division 9 and as otherwise noted in these Divisions 20, 22, and 23. Where such items are noted for field finishes, leave all work in clean, paintable condition to the acceptance of the Painting Trade Contractor.
6. Valve Identification:
1. Identify location and system under valve control with a colour-coded thumbtack under valve on lay-in ceiling tile.
  2. Label each balancing valve with a waterproof plastic tag, showing ID code, dial setting, flow, and date of balancing. Attach the tag securely with a tie-wrap or similar device capable of withstanding the temperatures that the valve will experience in operation.
7. Underground Tapes:
1. Electrical Warning Tape: 6 mil, 3 inches (75 nominal mm) wide polyethylene.
    1. BURIED ELECTRICAL LINE BELOW - No.37236 by Seton or accepted equivalent.
  2. 50mm (2") Metallic Detection Tapes:
    1. BURIED SEWER LINE BELOW - No.37220 by Seton or accepted equivalent.
    2. BURIED WATER LINE BELOW - No.37222 by Seton or accepted equivalent.

8. Pipe Painting and Identification

1. Exposed piping shall be painted in Owner's standard colours unless otherwise required by Code or Bylaw. Pipe painting shall be performed in accordance with the field painting requirements described in Division 9. Cooperate with Painting Trade Contractor to identify piping to ensure colour code is followed.
2. The Owner's schedule of colour coding for pipes shall be used as a standard throughout in accordance with identification of all piping on campus. The colour numbers have been taken from Federal Standard 595B. Conform additionally with CSA B53 – Identification of Piping Systems and ANSI/ASME A13.1 / 2007 - Scheme for the Identification of Piping Systems. The entire piping system is to be identified, including piping located in ceiling spaces, interstitial spaces, or within walls.
3. Piping in Other Areas - In areas other than Mechanical Rooms, etc., where piping is exposed to view in the finished work, such as exposed ceilings in Fire Apparatus Bay, piping shall be painted the same colour as the interior finishes, to the Consultant's satisfaction, performed by the painting trade contractor, except for colour code marking. The primary colour shall be applied in a band approximately 10" wide at each location where piping penetrates a wall, floor or ceiling, with the secondary colour band 2" wide in the middle of the wider band.
4. Pipe identification is required by the Owner as follows:
  1. at every point of entry or exit to a space, where the pipe penetrates a wall, floor, service column or enclosure;
  2. within 3 ft. (1 m) of and behind access doors;
  3. within 3 ft. (1 m) of pipe termination point;
  4. within 3 ft. (1 m) of branching off (or connecting to) a distribution header;
  5. at least every 25 ft. (8 m) along straight pipe lengths.
5. Pipe identification shall be visible from point of normal approach.
6. Pipe identification shall be applied to clean, dry surfaces only and installed according to manufacturer's instructions.
7. Identification markings and coding described in this Division shall be performed by the Trade Contractor responsible for the Building System to which such markings and coding apply. Install markings and coding after acceptance of finishes, to locations required by specification and to facilitate identification of systems in accordance with requirements of authorities having jurisdiction, including to concealed spaces. Timing of application for such markings shall be co-ordinated to suit progress of the Work.
8. In addition to the requirements for identification for piping that shall be provided, all grey water supply piping and other supply piping to domestic water fixtures that carries water within the building from cisterns, rain water leaders or other sources of non-potable water shall be clearly banded and marked with identification reading "non-potable water" at maximum 2 metre intervals, regardless of location and regardless of whether such piping is accessible in the finished work, to meet requirements of authorities.
9. Pipe label configuration is required by the Owner as follows:
  1. Pipe identification shall consist of a label identifying the piping system contents, along with directional arrows indicating the flow direction.
  2. Flow direction arrows shall be located at both ends of the pipe identification label.
  3. Electrically traced piping shall have additional identification to show it is traced.
  4. Nylon cable ties shall be used to secure pipe identification labels at both ends. Cable ties are in addition to the method of attachment provided by the pipe identification label itself.
  5. Piping installed shall be identified using labels meeting requirements defined below.

10. Pipe label sizing is required by the Owner as follows:

1. Pipe identification and flow direction markers shall be appropriately sized to match the outer diameter of the finished pipe installation.
2. Label length and minimum text height shall be determined based on outside diameter of the finished pipe installation as follows:

Outside Pipe Diameter	Minimum Length* of Label	Minimum Text Height
1/2" – 1-1/4"	8"	1/2"
1-1/2" – 2"	8"	3/4"
2-1/2" – 6"	12"	1-1/4"

\*Note: minimum length of label does not include flow direction arrows, which shall be additional

11. Pipe label materials:

1. semi-rigid plastic vinyl label printed with applicable abbreviation from Legend below;
2. label shall include text and flow direction arrows;
3. label and text colour as defined in Legend below;
4. chemical, UV light, and heat resistant, waterproof;
5. piping up to 6" OD: coil wrapped to snap around pipe and provide 360° visibility;
6. standard of acceptance shall be Brady: Snap-On and Strap-On, Seton: Snap-Around, SMS Smillie McAdams Summerlin: Coil Mark, Dura Label: Pipe Grabber Sleeves

12. Pipe Legend

Label Abbreviation	System, Pipe Contents	Colour (Text – Background)
NAT GAS	Natural Gas (all piping yellow)	Black – Yellow
PUMPED COND	Pumped Condensate	Black – Yellow
VENT	Vent (non-plumbing)	Black – Yellow
POT CW	Potable Cold Water	White - Green
POT HW	Potable Hot Water	White - Green
POT HWR	Potable Hot Water Recirculation	White – Green
TEMPERED	Potable Tempered Water – Safety Equip.	White – Green
SAN VENT	Sanitary Vent	White - Green
SAN	Sanitary Waste	White – Green
STEAM	Steam Condensate	White - Green
STORM	Storm Water Drain	White - Green

13. Identification markings and codings shall be performed by the Trade Contractor responsible for the Building System to which such markings and coding apply. Install markings and coding after acceptance of finishes, to locations required by specification and to facilitate identification of systems in accordance with requirements of authorities having jurisdiction, including to concealed spaces. Timing of application for such markings shall be co-ordinated to suit progress of the Work.

9. Welding and Hot Work

1. Welding shall conform to the Welding Procedure Specifications (WPS) of CSA, and more particularly the W59/CSA W47.1 Standards and the AWS D1.1, AWS D1.3 and AWS D1.6 welding codes, all in their latest amended forms. Welders shall be licensed and certified in accordance with such standards and requirements of all authorities having jurisdiction for type of welding used, and such certification shall be valid at the Place of the Work. Either gas or electric welding may be used, as recommended by the manufacturer of the materials to be joined.

2. In every case of welding or hot work temporary protection and fire protection shall be designed and provided by the Trade Contractor performing the welding or hot work in accordance with Division 1 requirements and as necessary to eliminate the risk of fire hazard from such operations. Notwithstanding the responsibility for temporary protection that remains solely with the Contractor, every field welding operation required by the Work includes a written report assessment submitted by the Trade Contractor and Contractor that identifies the potential fire risks and potentially flammable or combustible materials at and adjacent to the proposed location of the work, or that may be affected by the welding or hot work. The assessment shall detail the methods by which the potential fire risks are to be eliminated. Operations shall be in accordance with the requirements of the reference information and existing conditions contained in the Contract General Conditions, Supplementary Conditions, and Existing Conditions documentation.
3. Every welding and hot work operation adjacent to existing services shall be reported to the Owner using a copy of the written report specified above, and to requirements of Safety Sections of Division 1, and the work shall include any requirements requested by the Owner for arrangement of the work.

#### 10. Bases, Supports and Fasteners

1. All bases, supports, and fasteners shall conform to the requirements described in Division 1 as if repeated herein. This contract requires that all duct, pipe, and equipment support be to requirements of the Ontario Building Code and these specifications, but not to OBC Post-Disaster requirements.
2. In general the Trade Contractor installing a device, product, component, or material shall design and provide all fastenings, brackets, supports, bases, stands and platforms necessary for its installation to meet the requirements and performance noted in Division 1 and reference material, taking into account the characteristics of the component and the Building Systems of which it forms part, the recommendations of the component manufacturer for the specific installation location, and all existing conditions and conditions of service life.
3. This Contract requires the design and provision of all securement, anchorage and other fastenings necessary for the installation of the Work, using good practice and principles for such design identified in Division 1. Design of fastenings shall assume 50% failure of fasteners in each load transfer condition (compression, tension, and shear). By way of illustration, for a bracket with fastening plate subject to tension in top fasteners, compression in bottom fasteners, and shear transfer in all fasteners, such bracket must be fastened with a minimum of two top fasteners and two bottom fasteners each capable of fully accepting the imposed design load to allow for failure of one of the fasteners in each condition.
4. Curbs surrounding mechanical rooms, surrounding floor penetrations in mechanical rooms, and concrete housekeeping bases for major equipment in such rooms, are required as part of the Work.
5. All supports and fasteners shall be designed to minimize vibration transfer from operation of systems and anticipated conditions of service life.
6. Design and install supports so that system components can be adjusted after initial erection to achieve tolerances, be true in respect of alignment and grade, and allow controlled movement in accordance with Division 1 requirements for quality and to optimize the performance of the system in the conditions of anticipated service life. Provide such adjustments to optimize the installation immediately upon acceptance of tests during system rough-in.
7. Responsibility for the design and provision of supports and fasteners rests with the Trade Contractor installing the Building System that requires such support, until the forces imposed by the system components are correctly transferred to components of the building structural system at locations capable of accepting such transfer. The Building System Trade Contractor is responsible for evaluation of the structural Building System components and shall propose in writing the forces and locations of such proposed transfer, for acceptance by the Consultant.

In general, the structural Building System is composed of load-bearing concrete and masonry assemblies, structural steel, load-bearing studs and framing, and structural steel deck. Such components are identified on the structural drawings. The Trade Contractor may not transfer forces to structural steel roof deck, or elements not shown on structural drawings such as non-load-bearing masonry and framed partitions, suspended ceilings, and other similar items of the Work or existing conditions without the written acceptance of the Consultant, and only then for minor and "end of system" devices of the Building Systems with flexible connections, such as diffusers in ceiling systems.

8. Mount base mounted equipment on chamfered edge concrete housekeeping pads, minimum of 150 mm. (6") high and 150 mm (6") larger than equipment dimensions all around, and of further height as required to ensure that drain pan p-traps for all AHU's remain primed during operation.
  1. Each housekeeping pad (with muriatic acid solution) and rinse with clear water.
  2. Verify required acid-alkali balance is achieved and allow to dry.
  3. Paint concrete housekeeping pads with a water based epoxy; e.g. Glidden True Glaze Epoxy (WB), colour to match surrounding floor as closely as possible.
9. Do not use explosive or percussion type fastenings of any kind without prior acceptance in writing from the Consultant. Fasteners through floors and coatings must be sealed with neoprene gaskets and all brackets isolated from floors with neoprene gasket.

#### 11. Hangers and Structural Framing Support

1. Hangers and structural framing supports are forms of support that are required by this Contract and shall be provided in accordance with the following particular requirements as well as the general requirements for supports and fasteners noted above. The Contract requires that each Building System Trade Contractor shall design and provide all systems of hangers to support unburied lengths of piping, ducts, control conduit, equipment, and any other components of the Building System for which the Trade Contractor is responsible. Obtain acceptance of methods of hanging and structural support to building before proceeding. Submit to the Consultant a proposed support method for all components of the Building System. Ensure that imposed design loads on the building structural system do not exceed maximum services loading shown in the Documents or as allowed by Consultant acceptance. Take special care to avoid introduction of undue reaction forces, sound transfer, movement and vibration into structure of building, to flanges of pumps and equipment, to expansion joints, to piping, and to other components of the Work or Building System.
2. Design and provide hangers and structural framing support to meet OBC requirements and this specification, so that insulation of system components can be effectively and most conveniently achieved by subsequent insulating operations.
3. Structural framing support shall be by Allstrut or Unistrut and shall incorporate all accessories required to accommodate hangers as specified herein. Size members, rod, and anchorage in strict accordance with manufacturer's design tables, to support anticipated loadings. Allow 20% further space and loading on supports for Owner's subsequent additional use.
4. Support unburied horizontal cast iron piping at each hub length and at maximum 5'-0" (1525mm) centres with Myatt #124 clevis hangers or equivalent by alternative manufacturer Grinnell. Where groups of fittings occur, not more than 2'-6" (760mm) shall be between hangers.
5. Support other horizontal piping with Myatt #124 clevis hangers or equivalent by alternative manufacturer Grinnell, with minimum of two supports to each direction of runs in excess of 1 metre, and as follows:
  1. Up to 32 mm size, 6'-0" (1830mm) maximum spacing
  2. 1.5" (38mm) size, 9'-0" (2700 mm) maximum spacing
  3. over 1.5" (38mm) to 3" (76mm) size, 10'-0" (3050mm) maximum spacing
  4. 3.5" (88mm) and larger size, 15'-0" (4570mm) maximum spacing

6. Support piping in accordance with more stringent requirements of Plumbing Code or other regulations where such regulations and codes are more stringent than this specification.
  7. Provide oversized hangers for piping to permit insulation to pass through hangers.
  8. Where hangers are grouped, locate spacing of support along its length by smallest size pipe.
  9. Do not use trapeze type hangers unless specifically shown on drawings or specification. Where trapeze hangers are used, fit insulated piping with Myatt #251 or Grinnell #167 insulation shields taped to insulation.
  10. Support through runs of vertical piping to adjacent building structure or support framing to adjacent building structure provided by this Trade Contractor in accordance with this Section, with Myatt #182 or Grinnell #261 riser clamps at each floor level of building structure or maximum of 10'-0" (3050mm) whichever is shorter. Secure vertical RWL, soil and vent risers at minimum 5'-0" (1525mm) intervals and to the acceptance of the Consultant. Secure small vertical piping with long ring stays.
  11. On copper piping, provide separation material and effective barrier to ensure no contact between the copper and ferrous hangers, concrete or masonry, or other portions of the Work or existing conditions.
  12. Support hangers with threaded mild steel hanger rods sized in accordance with hanger manufacturer's tables. Design and provide fastening to building structure by embedment of purpose-made male-female lag screw thread adaptors into wood construction, by Grinnell #281 or equal inserts into concrete, by beam clamps on to structural steel work, or by bolts or welding, all in accordance with support and fastener requirements described in this Section. Only where inserts are incorrectly cast-in may surface-fastened anchors be used.
  13. PSupport piping on load-bearing walls with Myatt #157 offset wall hooks with toggle bolts or concrete anchors designed and sized to suit conditions. Fastening to load-bearing stud assemblies will only be permitted where fasteners impose loads directly to studs, and not to intervening wall surface components.
  14. Where structural bearings do not exist in the structural Building System or existing conditions, this Trade Contractor shall provide miscellaneous steel angle or channel of sufficient size from other structural bearings to support hangers or equipment. Design and provide this support in accordance with Division 5 requirements for miscellaneous metals. The Contractor and Trade Contractor are cautioned that such miscellaneous metals are not shown on drawings of any kind, but are required by the Contract.
  15. Wire, chain, strap or extension bar hangers are not acceptable under any circumstance.
  16. Hangers shall be arranged so as to load structural steel in a concentric manner. Loads to be imparted on joists shall be imposed within 6" (150mm) of panel joints, to top chord of steel joists only.
  17. Hang piping and other conduits for at least 2 (two) support points and a minimum of 10'-0" (3050mm) from isolated equipment or devices with Burgess Vibro Acoustics or equal "SH" isolators with steel spring having 1" (25mm) minimum static deflection and series connected elastomer element having static deflection of 1/4" (6mm) under load.
12. Sleeves, Firestopping, Smoke Seals, and Sealant Work
1. Where pipes or other system conduits of 3" (78mm) diameter and larger pass through concrete walls, provide metallic pipe sleeves of equivalent weight and material. Size sleeves on insulated piping or ducts to permit insulation to continue through sleeves, and in accordance with clearances for firestopping designs selected and provided by the Firestopping Trade Contractor.

2. Where conduit or ducts pass through concrete or frame construction above ground, provide 1.3mm thick galvanized steel sleeves. For copper pipe, provide equivalent copper pipe sleeves.
  3. Sleeves on buried piping shall be 2" (50mm) larger all round than pipe and be filled with 2" (50mm) thick mineral wool insulation by Roxul or equivalent. The Trade Contractor installing the penetrating element shall caulk full perimeter of joints both interior and exterior with sealants to the requirements described in Division 7.
  4. Firestopping and smoke seals are described in Division 7. All trade contractors shall co-ordinate and cooperate with the Contractor in the contractual division of the Work so that firestopping is provided by a single manufacturer's ULC-approved and local authorities accepted firestop systems to achieve the requirements of the fire separation systems identified in the Work.
  5. No allowance shall be made for lack of sleeves or firestopping to constructed portions of systems, as a reason for not providing such sleeves and firestopping in new work.
  6. As set out in Division 7, this Contract includes the provision of:
    1. New firestopping to penetrations of new system components to new fire separations.
    2. New firestopping to new penetrations of existing fire separations, in order to maintain integrity and continuity of such existing separations.
    3. The Contract requirement is to all fire separations, whether new or existing, identified in the Documents wherever such lack of firestopping can be reasonably identified by the trade contractor's inspection of the Place of the Work and the existing conditions. Such an inspection is deemed to have been performed by the act of the trade contractor's submission of a bid to the Contractor for provision of the building system, without qualification or caveat.
  7. Sealant work is described in Division 7, and
    1. All trade contractors shall co-ordinate and cooperate with the Contractor in the contractual division of the Work so that sealant is provided by a single manufacturer's sealant to achieve the caulking and sealing requirements identified in the Documents, and to properly achieve sealing in existing conditions, regardless that sealant work shall be performed by each Trade Contractor for his portion of the Work (except to penetrations of exterior envelope, which shall be by the responsible Trade Contractor for the envelope).. This work includes, but is not limited to, sealing of all holes and openings for system components passing through floors and into shafts to a watertight condition. In firestopped conditions, sealing requirements may be accomplished by the firestopping work upon acceptance by the Consultant.
13. Access Doors
1. Each Trade Contractor responsible for a Building System described by these Divisions 20, 22, and 23 shall supply for all required locations, and in a timely manner, a 2.8 mm thick hinged metal access doors with frames suitable for the particular assemblies into which they shall be installed, for all access points in the system. Access doors shall be installed by the Trade Contractor installing the assembly through which access is required.
  2. Number and locations for access are not shown on drawings, and include but are not limited to locations in walls or ceilings to permit access to built in or inaccessible equipment, service points, controls, dampers, valves, cleanouts and components. Where lift out acoustic panel ceilings are used, access doors are not required but where requested by the Consultant panels shall be secured with accessible hold down clips and marked with Bildemup #6RH brass paper fasteners inserted through boards and bent over. Paint heads with red enamel before installation.

3. Access doors shall be equivalent to Stelpro Ltd. #722 flush type of size to suit ease of access for controls, valves, cleanouts, dampers or components serviced, minimum size 1'-4" x 1'-0" (400mm x 300mm) "Reach in", 1'-4" x 2'-0" (400mm x 600mm) "Crawl in", with prime coat finish, concealed hinges, screwdriver lock and plaster key. Access doors in finished masonry or drywall construction shall be #722 less plaster key. Access doors shall be #704 in drywall ceiling and #726E in plaster ceilings.
  4. Access doors in fire rated ceiling assemblies, all fire rated walls, duct shafts or in corridor walls shall be UL, ULC or WHI listed 1 1/2 hour fire rated access doors equivalent to LeHage #L1010, Nailor Hart #0900 or Acudor #150B with screwdriver lock.
  5. Acceptable Manufacturers:
    1. Smille, McAdams & Summerlin Ltd.
    2. Mifab (Modular Equipment Mfg. Inc.)
    3. Can Aqua Inc.
    4. Acudor Products Ltd.
    5. LeHage (Ancon Industries Ltd.)
    6. Nailor Hart Industries Inc.
  6. Upon award of Contract, Trade Contractors and the Contractor shall co-operate to select a single manufacturer for access doors throughout the Work, for consistent appearance.
  7. Access doors are to be provided (in ceilings or walls) adjacent to filter location and components of all mechanical equipment requiring service and maintenance.. Provide access doors in bottom of return duct at each heat pump for access to and cleaning coil.
14. Floor and Wall Plates
1. Provide one-piece nickel-plated flanges of stamped brass in finished areas at points where exposed uncovered pipe pass through walls, floor or ceilings. Secure plates at ceiling locations with integral brass set screw.
  2. Split plates will not be accepted.
15. Wiring and Electrically Operated Equipment
1. Provide component control connections to all equipment scheduled on drawings or noted in specifications as "Owner-supplied", that forms a component of mechanical Building Systems. This includes all hard-wired equipment, process equipment, and includes adapting factory connections, providing necessary relay modules, and altering wiring to adapt Owner's equipment plugs and fittings to system needs. "Owner-supplied" means supplied by Owner to this Contract from a source outside this Contract. All equipment required in the Contract is by definition NOT Owner-supplied.
  2. Approximate locations of electrical equipment, fixtures switches, outlets, and the like, are given on the drawings. Refer to the architectural drawings and room elevations for application. In absence of definite detail exact location of outlets shall be determined on site as work progresses.
  3. Confirm capacity, ratings and characteristics of equipment and items supplied by other Trade Contractors that are being incorporated into work of the Mechanical Trade Contractor. Resolve discrepancies before beginning power installations.
  4. In general, all motor starters for equipment will be supplied by the Trade Contractor that supplies the equipment, for installation and connection by the Electrical Trade Contractor under the work described in Division 26.
  5. Coordinate the exact location and verify characteristics of electrical provisions for the work described by Division 26 during the bidding period, and confirm upon Contract start.

6. The locations of starters, motors and associated equipment shall be coordinated with other Trade Contractors. Coordinate with the work of such Trade Contractors to ensure proper location of equipment. The exact locations of conduit terminations at electrically-powered units shall be determined from equipment manufacturers' shop drawings as approved by the Trade Contractor responsible for the system and accepted by the Consultant. Conduits must be installed to enter only in the locations designated by equipment manufacturers.
7. The right is reserved by the Owner and Consultant to alter the location of equipment and outlets a distance of up to 10'-0" (3050mm) without involving a change to the Contract amount, providing notice is given prior to installation.
8. The Electrical Trade Contractor provides power wiring and power connection to equipment where noted, regardless of supply by any Trade. The Electrical Trade Contractor provides all necessary wiring and connections that are "in line" in 120V and larger power wiring portions of the Electrical Distribution System, including wiring and installation of starters, interrupting thermostats, aquastats, speed controllers and time switches controlling equipment by interrupting the power feed to the equipment or device. Such devices and items are supplied by the Trade Contractor responsible for the Building System of which the item is a control or accessory component, and delivers the item to the Electrical Trade Contractor in a timely manner for incorporation into the Work and contract scheduling. Where systems and equipment have a power feed connection to a system control panel that incorporates line voltage power, and components of the system (including motors and equipment of whatever voltage) are then fed from that control panel, then the Trade Contractor responsible for that system shall provide the wiring and connection of such subsequent equipment and devices that are "down line" from the control panel unless it is explicitly noted otherwise on the drawings for each and every separate wiring requirement. The Trade Contractor, upon award of Contract, may elect to contract with the Electrical Trade Contractor for such work, but shall bid the work as set out herein.
9. The Electrical Trade Contractor shall wire and connect weatherproof unfused safety disconnect switches except as specifically noted above, fastened to exterior of roof mounted units, to acceptance. Electrical Trade Contractor shall supply such devices unless drawings and schedules for such units specifically note that such disconnects are factory-installed or manufacturer supplied. Where unit has been supplied without such protection, even though scheduled on drawings or noted in the specification, The Electrical Trade Contractor shall supply disconnects at the relevant Trade Contractor's cost and at no cost to the Owner.
10. All wiring for powering of components of a Building System must be in conduit or EMT using minimum #12 wiring and sized as required for deratings, with only the last 3 m of cabling being eligible for use of Bx cabling within ceiling areas with lay-in panel access. All components and wiring that is visible in the finished Work shall be in conduit. All work in service rooms and all work above drywall ceilings shall be in conduit.
11. In general, electric control connections and wiring necessary to provide control of components of a Building System, to ensure its complete and integrated function, and to ensure it fulfils each and every requirement of the system sequences of operation and the functions of the component, shall be provided by the Trade Contractor responsible for such system, except as noted above for devices "in line" with Electrical Distribution System and devices that are explicitly scheduled for provision by the Electrical Trade Contractor or Building Monitoring System Trade Contractor.
12. All wiring for control of components of a Building System must be in conduit or EMT appropriately sized for deratings, using min. #18 wire for 24 volt control or less, and minimum #14 wire for 120V control. All wiring must be concealed except where explicitly accepted by notation on drawings or where located in service rooms. Use exposed conduit where wiring cannot be concealed in finished areas, after obtaining acceptance of Consultant in each case.
13. Electrically operated equipment shall be C.S.A. accepted and bear acceptance label. Special Inspection Label acceptable to provincial authority having jurisdiction will be accepted in lieu of C.S.A. acceptance.

16. Electric Pipe Tracing

1. Provide electric pipe tracing to all exterior and unheated locations of plumbing piping, prior to installation of pipe insulation, regardless of whether such tracing is shown on drawings. Only heat pipe tracing shown on electrical drawings shall be provided by the Electrical Trade Contractor. All other heat tracing required shall be provided by the Mechanical Trade Contractor.
2. Electric pipe tracing shall be Raychem 5XL-2-CR for freeze protection and HWT-Plus for temperature maintenance. All heat tracing cable shall be hard-wired, without exception.
3. All pipe tracings shall be 208V/1/60 or 120V/1/60 to suit Division 26 requirements.
4. Electric tracing shall be done with U.L. listed Raychem to pipes where required and as noted.
5. Each Trade Contractor shall provide splicing kit, thermostat, tee kit and end seals for cables as required to suit each installation.
6. Provide labels on completed covering at appropriate locations (to Consultant's acceptance) stating "Electric Traced".
7. This Trade Contractor shall arrange and pay for the provision of one 15A breaker in nearest 120V/208V or 120V/240V power panel breaker for each pipe tracing required by this specification and piping locations. Provide 2 #12 plus grounding in 5/8" (16mm) conduit from breaker to the pipe tracing cable c/w disconnect switch between power breaker and pipe tracing cable. Provide accessible junction box and all wiring and connections. All pipe tracing shall be hard-wired.

17. Motors, Starters and Controls, Variable Speed Drives

1. General

1. The Contractor and all Trade Contractors are directed to the definition of Building System and of Control(s) as described in Section 200500.
2. The Electrical Trade Contractor shall provide suitable power wiring and connect such power wiring to motors, disconnects, and starters as described in the Electrical Documents.
3. Each Trade Contractor responsible for a Building System shall provide the motors, motor starters, controls and their accessories required to operate equipment and devices and to achieve performance of the Building System of which they form components. Provide necessary wiring diagrams and installation instructions. Starters and control components and accessories shall be for surface or flush mounting as required or noted. Each motor shall have an accepted starter and an accepted means of control to achieve its intent in the sequences of operation.
4. Arrange equipment, piping, ductwork, etc. to permit access to and mounting of motors, starters and controls. Co-operate with Electrical Trade Contractor to ensure electrical equipment can be installed and serviced. The Trade Contractor responsible for the Building System shall inspect the Electrical Drawings and Specification to ensure that all electrical power, disconnects, and starters to system components are provided in this Contract. The same Trade Contractor shall provide all controls for the Building System unless specifically stated in the Contract Documents that such control components are provided by another Trade Contractor.
5. Under no circumstance shall a Building System be provided in this Contract without the means to operate to achieve design intent and all sequences of operation that it must perform. All such work, including components and installation, is required by this Contract for each Building System, independent of building monitoring system, unless specifically specified as Building Monitoring System control.

6. Primary plumbing, heating, ventilating and air conditioning starter equipment shall be provided so that these units will automatically restart on resumption of power after power outage. Starters for this type of equipment with motors 7.46 KW and larger shall be equipped with Agastat delay timing relays to stage starting times as directed at minimum 10 second intervals, complete with warning nameplate. Not more than 40 KW shall be started in any one time interval.
7. The Trade Contractor responsible for a Building System shall co ordinate the related control schemes of motor starters, contactors and relays of that system with requirements of other Building Systems. This Trade Contractor shall provide the control wiring in accordance with "Reviewed" Shop Drawings to provide necessary operational sequences.
8. Locations of starters, motors and associated equipment shown are approximate and diagrammatic only. Each Trade Contractor responsible for a Building System shall inspect schedules and layouts, and determine in co-operation with the Electrical Trade Contractor the location of equipment, motors, and starters to the acceptance of the Consultant.
9. Described in the Electrical Divisions are safety switches or remote lock out stations required for disconnection of remotely controlled motors and where required at motors by Power Authority regulations, whether or not shown on drawings. The Trade Contractor providing such motors shall co-ordinate with equipment suppliers and the Electrical Trade Contractor to ensure that such items are provided in the work of this Contract. For roof mounted fan motors, provide safety switch concealed in fan housing as part of equipment.
10. Where starters and controls for a Building System to be wired by the responsible Trade Contractor are grouped together and not in an M.C.C., the Trade Contractor shall provide suitable 3/4" (19mm) thick plywood panelboard to which such equipment shall be secured. Provide necessary steel angle for support of panelboard and paint entire assembly with two coats of enamel (ASA 61 grey or other accepted colour).
11. Remotely mounted pilot and control devices shall have enclosure to specifications described in Electrical Divisions and be flush type except in Mechanical and Service Rooms.
12. Control units shall be arranged in groups for the control of each Building System, arranged in proper functional sequence to acceptance.
13. Control wiring shall be 120 volt A.C. maximum. Provide control circuit transformers where these are not included in motor starters. Secondaries of control transformers shall be fused with one side grounded and controls, safety devices and interlocks shall be connected in ungrounded conductor, excepting only integral starter overload devices.
14. Single phase motors interlocked to start or operate with other equipment shall be provided with magnetic starters or suitable relays with necessary auxiliary contacts and double voltage relays with necessary auxiliary contacts and double voltage relays or be otherwise electrically separated.
15. Overload relay heaters for starters shall be selected and field adjusted to trip at maximum value of 115% of actual nameplate full load amperes. Selection of heater elements shall be based on starter manufacturer's recommendations. For this purpose, submit motor starter data which shall list the following for each motor:
  1. Proposed equipment nameplate data
  2. Actual full load amperes of motor
  3. Speed of motor in RS
  4. Temperature Class in degrees Celsius rise and insulation class
  5. Circuit breaker or fuse type and proposed rating
  6. Type of motor, duty and service factor



3. High Efficiency Motors
  1. All three phase motors 1 HP and above shall be high efficiency motors in accordance with CAN/CSA-C390-10, and shall be factory-tested.
  2. The Trade Contractor responsible for the provision of the motor shall make the application for to certifying authority when all the actual motor horsepowers are finalized within accepted submittals.
  3. All motors shall bear nameplates listing nominal full load efficiency.
4. Starters & Associated Controls for Building Systems
  1. The Trade Contractor responsible for each Building System shall provide the motor starters and associated controls required for the system, and as scheduled and noted. Except as noted, starters and controls shall be of manufacturer identified in schedules or acceptable equivalent described herein. All starters, contactors, thermal overloads, etc. must be EEMAC rated. All starters shall be of one manufacturer throughout all Building Systems except as specifically accepted otherwise for integral pre wired assemblies.
  2. Starter and control units shall be equipped with the necessary number of auxiliary contacts and relays to provide control sequences for the Building System of which it forms part, as well as to accept all inputs and provide all outputs to other Building Systems necessary for the co-ordinated operation of all systems. Auxiliary contacts shall be interchangeable normally open or normally closed, capable of conversion in field without additional parts exterior to starter.
  3. In addition to the requirements of this specification, provide all work that is reasonably inferable from the Starter Schedule on Drawings regarding auxiliary contacts for interlocks and control functions and provide necessary number and type to suit, whether noted on Schedules or not.
  4. Manual starters may only be provided for single phase equipment operated by a control device such as thermostat or limit control when such control device is rated for full electrical load of equipment.
  5. Manual starters provided for single phase equipment actuated by electric timer shall have H.O.A. feature. "Hand" position shall permit shunting of time switch. Where such units also have protective device (eg: firestat) such device shall be wired into both "Hand" and "Auto" positions and shall not be shunted.
  6. Manual starters may only be provided for three phase equipment which is not actuated by pilot control device (pressure switch, float switch, safety limit devices, remote manual control device) unless otherwise noted in Starter Schedule on Drawings.
  7. Magnetic starters for manually operated equipment shall have "On/Off" selector switch or "Start Stop" pushbutton in cover as scheduled. Where not scheduled, obtain clarification from Consultant.
  8. Magnetic starters which are started automatically by electric time switch shall include "Hand Off Automatic" (H.O.A.) selector switch. "Hand" position shall permit shunting of time switch. Where such units also have protective pilot device (such as firestats) such device shall be wired into both "Hand" and "Auto" position and shall not be shunted.
  9. Magnetic starters which are started automatically by remote pilot device (or interlocked units) such as level controller, pressure switch, thermostat or flow switch shall include a "Hand Off Auto" (H.O.A.) selector switch, and, where scheduled, a "Test" pushbutton. "Hand" position shall permit shunting of remote pilot device and thereby permit operation of starter but only while depressing "Test" button.

10. Safety control devices such as flow switches, pressure switches, high and low limits ("Fire" and "Freeze") shall not be capable of shunting by "Hand" position of switch.
11. Manual motor starters shall be toggle operated with the following general construction features:
  1. Quick Make, Quick Break mechanism with double break contacts.
  2. Overload protection heaters, one per phase and speed.
  3. Enclosure to suit application.
  4. Pilot light, neon lamp.
  5. Cover engraved with "On Trip Off"
12. Magnetic motor starters shall comprise electrically operated motor starters combined with disconnect switch with following general construction features:
  1. Quick Make, Quick Break mechanism with double break contacts.
  2. Fuse holders to accept specified fuses, one per phase.
  3. Adjustable overload relays, one per phase and speed.
  4. CEMA listed enclosure to suit application. Disconnect with mechanical cover interlocks, line side barriers and switch operated electrical interlocks to disconnect external control voltage unless starter includes suitable accepted enclosed contacts and connections.
  5. "Reset" button.
  6. Pilot lights of transformer type incandescent with amber safety lens cap.
  7. Control transformers with 120V fused secondary and sized to suit current rating of associated control devices.
  8. Scheduled cover mounted control devices with standard duty double break contact blocks.
  9. Minimum of two auxiliary contacts and as required to accomplish all control (unused "Seal In" contact may be included).
13. Magnetic starters shall be combination type with disconnect feature unless starter is built into unit control panel. Similar magnetic contactors shall be used for non motor applications. All starters operated by PLC to have A/O/H.
14. Contactors for non motor applications shall be built similar to combination magnetic starters, except less overload relays, and with Gould Shawmut AJT time delay HRC1 J fuses, rated for load, and with enclosed continuous current rating of at least 125% of connected full load.
15. "Double Voltage Relays" shall be CGE Model CR120 LXMC with general-purpose enclosure, number of contacts required and "Mylar" shroud for enclosure of contacts, or accepted equivalent.
16. Pilot devices such as "Start Stop" pushbuttons, "Hand Off Auto" selector switches and indicating lights shall be of heavy-duty construction. Indicating lamps shall be transformer type incandescent or LED with amber safety lens caps.
17. Each control unit shall be provided with engraved nameplates for designation of device controlled and duty. See Subsection "System Component Identification" for details.
18. The Trade Contractor responsible for each Building System shall supply suitable back-boxes for flush mounted devices to Electrical Trade Contractor where such devices are coordinated by the Contractor to be installed by Electrical Trade Contractor.
19. Supply to Owner at least three fuses of each size suitably labelled. Obtain duplicate receipt for same. Submit for review complete list of all starters showing make, size, accessories, labels and fusing.

20. Acceptable Manufacturers for Starters, Motor Control Centres, and relays are:

1. Cutler Hammer Industries
2. Siemens
3. Westinghouse
4. Furnas Electric Canada Limited
5. Square 'D' Company of Canada Limited
6. Allen Bradley Canada Limited
7. CGE

4. Variable Speed Drives (Not Required this Contract)

18. Pumps

1. Provide circulating pumps of sizes, types and capacities noted in Pump Schedule with impeller statically and dynamically balanced at factory. Each pump shall be factory tested and guaranteed to give required performance on proposed service. Pumps must be sized to achieve required flow under specified head using mid-range impeller, except pump motor which shall be sized for largest impeller size that the pump is capable of receiving. Each pump shall be additionally sized so that minimum impeller size shall not exceed 85% of cutwater point.
2. Provide line size (not pump inlet size) shut off ball valve and strainer ahead of each pipe mounted pump and check valve and shut off valve on each discharge.
3. Select motors to operate equipment at proper efficiency without overloading. See Wiring & Motors Subsection for further details such as start up and high-efficiency requirements. Each motor shall operate at 30 r/s maximum unless otherwise specifically noted.
4. Each vertical inline pump shall be single suction, Style #4030, bronze fitted, single stage, single end suction centrifugal type of radially split case design for removal of impeller, bearings, seals, etc., without disconnecting piping or motor. Entire bearing bracket assembly shall be removed and interchangeable.
5. Bearings shall be grease lubricated anti-friction ball or roller. Impeller shall be bronze with steel lock washer and cadmium plated lock screw. Seal assembly shall be of spring loaded, mechanical rotating type with carbon seal ring. Mechanical seal shall have integral flushing line with filter and valve, synthetic rubber bellows and brass or plated steel shell. Volute shall be cast iron with steel cap screws, cast iron cover plate and cadmium plated steel drain plug. Pump and motor shall be set on steel drain plug. Provide flo-trex valve and suction diffuser on each base mounted pump.
6. Pumps shall be suitable for not less than 862 kPa W.P. and have coupling guard.
7. Inline pumps 3 HP or lower shall be closed coupled.
8. Acceptable Manufacturers: (Pumps Large)
  1. SA Armstrong
  2. ITT Industries
  3. Taco
9. Acceptable Manufacturers (Pumps Small)
  1. Myers
  2. Taco
  3. SA Armstrong
  4. ITT B&G
  5. Grundfoss

19. Pipes and Fittings

1. Piping Tests

1. In addition to tests required by local authorities, test new piping and drains in presence of Consultant as described in each Section of these Divisions 20, 22, and 23.
2. Notify Consultant in writing at least 48 hours prior to start of tests. Failure to do so may require test to be redone.

2. General

1. Provide new pipe and fittings free from rust and scale of full weight, standard size and thickness, true and round with full cut threads where threaded connection methods are to be used. Cut pipes true with clean sharp pipe cutters. Ream and file ends of pipe and remove burrs from interior. Use reducing fittings instead of bushings wherever reductions in piping occur.
2. Install all piping to allow for expansion and contraction complete with swing joint as necessary.

3. Pipes and Fittings Materials and Products

1. Provide piping and fittings in accordance with Mechanical Specifications on Drawings.

4. Joints

1. Make all joints in piping to conform to Plumbing Code and to acceptance of Consultant and Plumbing Inspector.
2. Joints in buried pipe shall be of mechanical type as recommended by pipe manufacturer, ULI or ULC accepted and to local regulations.
3. Make joints in threaded pipe with lead free joint compound. Use of lampwick or hemp will not be permitted.

5. Expansion Provisions

1. The Contractor and Mechanical Trade Contractor shall inspect the documents, the existing conditions, and the reference documents, and shall identify all potential points of relative movement in the Building Structural System, ceiling, envelope and partition assemblies where installed piping of mechanical Building System crosses or penetrates these items, or is supported where live loads on the structure imposed by snow or occupancy may cause significant deflection of the supporting elements. The Contractor and Mechanical Trade Contractor shall ensure suitable provision in the piping installation for such movement. The Trade Contractor installing the piping shall install such expansion fittings and details within the piping to accommodate expected ranges of movement for the service conditions in which the system operates.
2. The Contractor and the Trade Contractor responsible for a system shall install piping with adequate provision for expansion and contraction of the system in reaction to changes in external temperatures or factors, or in reaction to internal fluctuations in temperature or other factors in the piping and system.
3. Additional measures required for isolation of equipment to ensure noise, movement, deflection, and vibration are not transmitted from equipment to the piping of the system are described in Sections for each system. In general, make provision for these factors and isolate all system elements that are subject to them using appropriate materials and methods acceptable to the Consultant.

## 20. Gauges and Valves

### 1. Gauges

1. Gauges shall generally be U.L.C. accepted pressure gauges, range 0 to 1050 kPa (0 150 psig) Metric or dual scale with at least 4 1/2" (114mm) dial face and complete with 6.4 brass petcock and snubber.
2. Gauges shall be sized in relation to design intent so that reading is generally in middle of gauge range.
3. Gauges for each mechanical Building System are specified in the section for such system, but the Mechanical Trade Contractor shall co-ordinate gauges among the systems so that one type and manufacturer is used throughout the Work unless a unique gauge is required for its application.
4. Thermometers shall be Ashcroft or acceptable alternative. Alternatives are Taylor, Terice and Winter's.
5. Gauges shall be Ashcroft or acceptable alternative. Alternatives are Taylor, Terice and Winter's.

### 2. Valves

#### 1. General

1. Sufficient valves shall be installed within each system such as to provide the required flow control service and to allow isolation for inspection, maintenance and repair of each piece of equipment, fixture and each main and branch service loop. A union shall be installed within 500 mm of each threaded valve, unless the valve can be otherwise easily removed from the line.
2. Each valve shall be installed such that it is easily accessible for operation, visual inspection and preventative maintenance. Valves shall be installed to isolate individual risers.
3. Valves for each mechanical Building System may be additionally specified in the section for such system, but the Mechanical Trade Contractor shall co-ordinate valves among the systems so that one type and manufacturer is used throughout the Work unless a unique valve is required or specified for its application.
4. Drawings and schematics do not show all valves required by the Contract. Provide all valves to suit drawings and schematics, and add valves where required or requested by the specification or reference standards. All such costs are including in the Contract Price and the Work.

#### 2. Acceptable Manufacturers –Valves to Fire Protection Systems

1. Valves shall meet requirements of governing authorities and codes, shall be rated for 175 psi or better, and shall be as specified in this Section and further as specified in the Fire Protection, Sprinkler, and/or Standpipe specification section as applicable.

#### 3. Domestic Water Valves

1. Up to NPS 2" inclusive: ball valves only, gate valves are not permitted. Substitute globe type valves for ball valves where throttling is required.
2. Globe valves NPS 2 and under, soldered

1. 850 kPa, to MSS SP-80, 300 CWP, bronze body, renewable composition PTFE disc, threaded over bonnet., lock shield handles as indicated. Standard of Acceptance is Kitz 10, Crane 1334/1320, Newman Hattersley 13 with NPT copper adaptors, Nibco S-235-Y
3. Globe valves NPS 2 and under, threaded
  1. 1000 kPa, to MSS SP-80, Class 150, bronze body, renewable composition PTFE disc, union bonnet, lock shield handles as indicated. Standard of Acceptance is Kitz 09, Crane 7TF, Newman Hattersley 13, Nibco T-235-Y
4. Swing check valves NPS 2 and under, soldered
  1. 850 kPa, to MSS SP-80, bronze body, bronze swing disc, regrindable seat, screw-in cap, Standard of Acceptance is Kitz 23, Crane 1342, Newman Hattersley 47 with NPT copper adaptors, Nibco S-413
5. Swing check valves NPS 2 and under, threaded
  1. 850 kPa, to MSS SP-80, Class 125, bronze body, bronze swing disc, regrindable seat, screw-in cap. Standard of Acceptance is Kitz 22, Crane 37, Newman Hattersley 47, Nibco T-413
6. Ball valves up to NPS 2
  1. 1000 kPa, two piece bronze body and stainless steel ball and stem, PTFE seat rings, solder joint or NPT to copper adaptors, full port. Standard of Acceptance is Kitz 69AMLL(soldered), Kitz 68AMLL (threaded), Crane 9212-SLL (soldered), Crane 9211-SLL (threaded), Nibco S-585-70-66LL (soldered), Nibco T-585-70-66LL (threaded)
3. Natural Gas Valves: Only valves with CGA certification embossed directly on valve body.
4. Steam and Condensate Valves (not Required this Contract)

## 21. Insulation

1. General Requirements for Insulation to Building Systems Described in Divisions 20, 22, and 23:
  1. Provide insulation of equipment, piping and ductwork as described or noted herein. Insulation is not shown on drawings. Insulation, jackets and adhesives shall be noncombustible, in compliance with Ontario Building Code; installed to manufacturer's standards, and to acceptance. Wheat pastes shall NOT be used. Products containing asbestos shall not be used. Make suitable accepted openings in insulation for inspection outlets and equipment nameplates.
  2. Materials shall be of best quality of their respective kinds and of uniform pattern throughout.
  3. All insulation products used shall be fully tested and accepted as fire retardant by Underwriters Laboratories of Canada Limited. Consultant may require submission of test data to composite insulation systems for fire hazard test rating.
  4. All insulating accessory materials shall be fire retardant. Adhesives shall be waterproof and incombustible flame resistant. Combustible wrappings or vapour barriers used in conjunction with thermal insulating materials shall be treated to reduce their combustibility. Flame spread classification of entire assembly shall not exceed 25 and smoke developed number shall not exceed 50. Submit report from an accepted testing laboratory confirming foregoing ratings.

5. White plastic purpose-formed covering shall be applied to all exposed insulation in the finished Work unless prefinished insulation is specified.
6. Where wire is specified to secure insulation, it shall be stainless steel wire, 1.3mm gauge, dead soft annealed type.
7. Insulation shall be continuous throughout the Building System unless specifically noted otherwise, and shall be installed by a qualified insulating trade contractor with experience in the provision of similar work. Submit qualifications of the insulating trade contractor for acceptance of the Consultant upon request.
8. Keep insulation materials dry and free of contaminants while in shipment and on site.
9. For insulation passing through floors, walls and similar barriers, co-ordinate size of sleeving with applicable trade Contractors to accommodate full thickness of insulation.
10. Insulation shall not be installed until piping and ductwork has been tested to Consultant's satisfaction. Repair to or replacement of insulation is required if installed prior to such testing acceptances being given.
11. This Contract requires insulation of the following Building Systems and components in accordance with the standards and prescriptive measures contained herein:
  1. All piping, fittings, headers, valves, flanges, and equipment and accessories to above-grade portions of storm, sanitary, water supply and hydronic transfer systems shall receive thermal insulation, complete, save only short runs of condensate piping to equipment mounted exterior to the building, gas piping, and portions of plumbing piping that function solely as venting.
  2. All interior portions of exhaust air ducts from backdraft dampers to louvres or outlets shall receive thermal insulation.
  3. Exterior of all ducts shall receive thermal insulation, except ducts for outdoor air intake ducts, which shall receive interior lined insulation.
  4. Gas piping shall receive insulation for a 2 metre length at all locations where it passes through the building envelope system.
  5. Transfer ducts need not be insulated with thermal insulation, but shall be completely lined with acoustic insulation to duct interior, shop installed.
  6. Initial 3 metres of supply and return ductwork from all fans, air handling units, packaged hvac units, furnace units and inline equipment likely to generate noise shall be interior-lined with acoustic insulation, shop installed.
  7. All return plenums shall receive acoustic insulation for first 3 metres of such ducts.
  8. All piping to exterior below grade locations shall be protected using rigid insulation placed above it where frost cover is deficient.
  9. All thermal insulation applied to exterior of pipes and ducts shall have an additional finish layer of cover, as set out in this specification.
12. Work that is inaccessible for application of insulation after installation shall be insulated and finished before being placed in position.
13. Acceptable Insulation Product and Material Manufacturer shall be Johns Manville top of line only.

Equivalent top of line Product and Material insulation from the following manufacturers are deemed acceptable alternatives:

1. Fiberglas
2. Knauf
3. Manson
4. Owens Corning

## 2. General Installation Requirements

1. Pipe and fittings shall be dry, free of dirt, scale, rust, oil and grease before insulation is applied. Rustproof ferrous materials where necessary as directed by Consultant using accepted materials and methods.
2. All insulation material and adhesives shall be installed in strict compliance with latest editions of manufacturer's recommendations and shall present neat workmanlike appearance upon completion.
3. Under no circumstances shall ambient temperature in space be less than 50 deg F during application of any insulation or finishing. Where higher temperature is required by manufacturer's recommendations, this higher temperature requirement shall be complied with.
4. Work shall only be performed by tradesmen experienced in insulation work.
5. Recover all interior insulation exposed to view with white PVC jacket.
6. Work that will be inaccessible for application of insulation after installation shall be insulated and finished before being placed in position.
7. Provide suitable accepted openings in insulation for inspection outlets, equipment nameplates and operating devices.
8. Install all insulation in first class manner with smooth and even surfaces. Outline of round insulation shall be true circular and concentric shape. Outline of fitting insulation shall be shaped to blend with adjacent covering. Do not use scrap pieces of insulation where full-length section will fit.
9. Joints in insulation shall be made by cementing pieces together and finishing so that there are no cracks or gaps.
10. Take care that insulation over flexible connections in piping does not unduly increase lateral or longitudinal stiffness of connections.
11. Sectional insulation furred into spaces or concealed in walls, hung ceilings and pipe spaces shall not have extra jacket. However, canvas covers supplied as standard on insulation used in such locations, shall remain with overlap pasted down.
12. Keep insulation clear of instruments, controls, components, access doors and operating devices so that it will not hinder or interfere with removal, setting, reading of or access to same. Verify with Consultant as to whether such items are located properly before applying any insulation, otherwise be responsible for all retouching that may be required.
13. Repair and reseal all breaks, cracks and perforations in vapour barriers. Seal all weld pin penetrations of vapour barrier with 4" x 4" (100 x 100mm) patch of aluminium foil tape.
14. All insulation exposed to view in the finished Work shall be completed ready for painting as described in Division 9 by another Trade Contractor unless otherwise noted for finishes to be performed by the Insulating Trade Contractor.
15. Insulation shall continue through sleeves and openings except at "Required Fire Separations" where sleeves and openings shall be "Fire Stopped". See 200500 - Sleeves. Insulation shall be butted tight to fire stopping and vapour sealed.
16. Insulate all piping noted to be electrically traced. Install insulation after electric trace wiring is tested and accepted.

### 3. Pipe Insulation

1. For all unburied domestic cold water piping in the Work, including headers: 1" (25mm) thick heavy density glass fibre preformed pipe insulation with maximum of 0.033 conductivity at 10°C mean with factory applied vinyl foil kraft laminated glass fibre reinforced fire resistive vapour barrier jacket with not more than 1.15 perm rating (ASJ) with sealed lapped joints. Insulate heat pump condensate lines similarly.
2. For all unburied domestic recirculation and hot water piping in the Work, including headers: insulate with heavy density glass fibre preformed pipe insulation with maximum 0.043 conductivity at 93°C mean with factory applied fire resistive vapour barrier jacket of not more than 1.15 perm rating. Use 1" (25mm) thickness on piping up to 2" (50mm) size, and 1 1/2" (38mm) thickness on piping 2 1/2" (63mm) and above.
3. For all above-slab water and waste piping and trap below each Handicapped lavatory in the Work: insulate with 1/2" (13mm) Armaflex II or Acwil "Therma Cel" flexible foamed elastomeric insulation. Paint insulation with two coats of "White Finish".
4. For all unburied Storm Sewage System rainwater leaders and storm drains both exposed and concealed in the Work: insulate with 1" (25mm) thick fibre-glass pipe covering with factory applied aluminium fire resistant vapour barrier and sealed lapped joints. Insulate underside of roof hoppers and roof drains.
5. For all exterior exposed piping in the Work: weatherproof insulation with two coats of Flintkote #C 29 applied over 45# building paper copper wired on and sealed to acceptance. Install insulation after electric trace wiring is tested and accepted.
6. For all pipe insulation in the mechanical rooms and areas apply smooth coat of insulating cement and recover with 6 oz (203.4 g/m<sup>2</sup>) canvas jacket neatly parted on with fireproof adhesive, then cover with PVC jacket.
7. Pipe insulation shall be carried uninterrupted through pipe sleeves except where otherwise noted or required by Ontario Building Code or local authority. Where space will not permit application of sectional insulation on pipes in sleeves, pack sleeves with accepted fire-stop material.
8. Carry insulation through hanger clevises and where noted. Use insulation protection saddles between clevis and insulation.
9. Insulate water piping in cupboards and closets as for exposed piping.
10. Hangers directly supporting cold water piping shall be insulated and vapour sealed as part of adjoining pipe.
11. Buried cold water piping need not be insulated.

### 4. Insulation of Valves and Fittings

1. Insulation shall be continuous on piping systems. Insulate valves and joints to same thickness of insulation as specified for pipe. Seal vapour barriers to acceptance where pipes pass through sleeves after sleeves are packed.
2. Do not insulate unions but terminate pipe insulation neatly with cement at each end of unions except on cold water piping where unions shall be insulated and marked for identification of union locations.
3. Insulate valves and fittings with 1" (25mm) glass fibre blanket conforming to CGSB #51 BF11 compressed to same thickness as adjoining insulation and secured with jute twine. Over this apply smooth coat of insulating cement and recover with 4 oz. (135.6 g/m<sup>2</sup>)

canvas. On cold water piping wrap blanket with foil faced friction tape overlapped to form vapour barrier before applying insulation cement. Seal all vapour barriers.

5. Insulation of Ducts

1. Seal duct insulation with mastic at all joints and pins. Tape all joints with accepted self-adhesive foil faced glass fibre reinforced 2" (50mm) wide vapour barrier tape. Where ducts are sound lined or fire proofed thermal insulation is not required but shall overlap liner at least 6" (150mm) except where noted.
2. Co operate with sheet metal installer to ensure correct installation of insulation plugs for pitot tube test openings in ductwork.
3. Duct insulation shall be carried uninterrupted through sleeves except where otherwise noted or required by Ontario Building Code or local authority. Where space will not permit application of sectional insulation on ducts in sleeves, pack sleeves with accepted fire stop material. Seal vapour barriers to acceptance where ducts pass through sleeves after sleeves are packed.
4. Where duct insulation is secured by wire, it shall not be drawn so tightly as to unduly compress insulation. Where Consultant finds insulation has been compressed too much under wire or twine or at corners, it shall be removed and reapplied.
5. Sagging of duct insulation is not acceptable. Remove and reapply.
6. Do not break continuity of insulation vapour barrier by hanger or rods. Remove hangers temporarily to facilitate installation of vapour barrier where required.
7. Provide cap strips to cover turned out legs of duct reinforcing & supporting members.
8. Seal duct insulation at all joints, pins and openings. Tape joints with accepted self adhesive foil faced 2" (50mm) wide vapour barrier tape.
9. Glass Fibre, Flexible Insulation: ASTM C553; flexible, non-combustible blanket, 'ksi' value: ASTM C518,0.045 at 24°C, maximum service temperature 121°C, maximum moisture absorption 0.20 percent by volume, vapour barrier jacket kraft paper with glass fibre yarn and bonded to aluminized film, moisture vapour transmission ASTM E96 0.02 perm. Secure with pressure sensitive tape. Vapour barrier tape: kraft paper reinforced with glass fibre yarn and bonded to aluminized film, with pressure sensitive rubber based adhesive. Outdoor vapour barrier mastic: vinyl emulsion type acrylic or mastic, compatible with insulation, black colour. Tie wire: annealed steel, 1.5 mm.
10. For all outdoor air supply and exhaust ducts (between unit and outside terminations) and for minimum 10'-0" (3050 mm) of exhaust air ducts as measured from exterior: interior insulate with 1" (25mm) thick, 72 kg/m<sup>3</sup> density glass fibre rigid insulating board with foil vapour barrier, pinned on, with joints taped and sealed with noncombustible adhesive.
11. Internal insulation and lining to ducts is additionally described in Section 223000.
12. Glass Fibre, Rigid Insulation: ASTM C612 rigid, non-combustible blanket, 'ksi' value: ASTM C518,0.036 at 24°C, maximum service temperature 121°C, maximum moisture absorption 0.20 percent by volume, density 48 kg/cu.m. Vapour barrier jacket: kraft paper with glass fibre yarn and bonded to aluminized film, moisture vapour transmission ASTM E96; 0.02 perm. Secure with pressure sensitive tape.

13. Duct Insulation Schedules

Service	Type	Thickness
Air supply rectangular	rigid	25mm
Air supply round	flexible	25mm
Exhaust 6' (2 m) from outside) rectangular	rigid	75mm
Exhaust 6' (2 m) from outside) round	flexible	75mm
Fresh air intake rectangular	rigid	75mm
Exhaust air plenums	rigid	75mm
Ductwork outdoors	rigid	75mm"

6. Insulation of Access Doors in Ducts

1. Ensure that locations of access doors are confirmed and access doors installed wherever possible in the sequence of construction of the system, prior to beginning insulation installation.
2. Provide insulation to access doors to ensure operation of such doors. Where insulation is provided to components of systems where such doors are located, provide insulation to such access doors.
3. Insulate each duct access door to maintain insulation and vapour barrier rating when access door is closed.

22. System Component Identification

1. General Valve Identification and Manuals

1. All valves shall be identified as follows:
  1. To each valve, throughout the project shall be attached a brass tag, secured with a 3.5 mm thick brass ring and numbered to correspond with numbers, service description and location on chart.
  2. In each fan room or mechanical room, the mechanical contractor shall provide a glazed and framed valve chart permanently affixed in an accepted location; the chart shall have typed on it, the numbers of the valve tags in the particular fan room or mechanical room and the service description of each valve, including lines controlled. Mount 5'-0" (1500 mm) a.f.f to bottom of chart.
  3. In addition to the above, four (4) weeks prior to the completion date, or proposed takeover date of the project, the mechanical contractor shall provide to the Owner, four 215 x 280 mm loose leaf, three ring binders containing complete valve charts which shall list all of the valves in the building, including those in the fan or mechanical rooms. The charts shall list, types numbers corresponding to the valve tags, the service description of each valve and the location of the same. The charts shall be covered in heavy clear plastic.
  4. All of the above information must be available to the Owner's maintenance staff before takeover procedure can start.

2. Provide on each valve a 1" (25mm) diameter or larger brass tag with punched and embossed numbers. Valves immediately adjacent to plumbing fixtures or radiation need not be tagged. Each building system shall have a separate valve tag format and chart, clearly differentiated from tags for other systems. All valve charts shall be mounted in the same location for clarity of the differing identification systems.
  3. Similarly glass frame each pressure vessel or H.W. tank certificate under glass and mount where directed in room where unit is located. Mount 5'-0" (1500mm) a.f.f. to bottom.
  4. Provide and attach to each item of equipment (including electric motors), proper manufacturer's nameplate showing size, model number, serial number, and all information usually provided including voltage, cycle, phase and horsepower of motors and name and address of unit manufacturer.
  5. Ensure stamped, etched or engraved lettering on plates is legible. Nameplates shall not be painted over and where apparatus is insulated, provide adequate openings in insulation for viewing purposes.
  6. Provide on each item of equipment, starters, timers and controls suitable nameplates, e.g. "Heat Pump #1, Second Floor Toilet Exhaust Fan Timer". Before nameplates are made, submit sample and list of names for acceptance. Make nameplates of 1.6 mm thick weather resistant rigid laminated plastic with engraved white letters on black background. Secure nameplates with drive screws. Make letters on starters, timers and small items at least 5mm high and at least 10mm high on larger units such as pumps, fans, boilers, A.C. & S.A. Units, H.P Units and condensers. Generally, unit nameplates shall conform to those noted in their Schedules. Where equipment and apparatus is insulated, the nameplate shall be mounted on the outside of the insulation. Original equipment nameplate data shall not be obscured and covered, but shall be left in a legible condition on each piece of equipment. The nameplate shall also give the design capacity of the equipment and the electrical characteristics.
  7. Provide engraved black and white lamacoid plastic nameplates, 1" x 2 1/2" (25mm x 63mm) minimum at all duct mounted instruments, reset controls and panels so as to clearly indicate service of particular device. All manual switches unless they come with a standard nameplate shall be similarly labelled.
  8. Provide for each concealed equipment requiring maintenance servicing, a stamped nameplate fixed to ceiling grid or ceiling access door indicating location of filters or similar to facilitate servicing. Obtain Consultant's acceptance of nameplate before installing.
23. Sequence of Operation and Building System Requirements
1. Complete controls for each Building System shall be provided by the Trade Contractor responsible for the Building System in order to achieve a complete and operating system. See Building System Requirements for co-ordination.
  2. Under no circumstance shall a Building System or alteration to a Building System be provided in this Contract without the means to operate to achieve design intent and all sequences of operation which it must perform in expected service condition. All such work to achieve this performance, including components and installation, is required by this Contract.
  3. All Trade Contractors and the Contractor are specifically cautioned that Building Systems must be provided with all controls, wiring, and components necessary for their operation, exclusive of any automated building energy monitoring or energy management control system. The function of such monitoring systems is to monitor and provide additional control that improves the energy performance of the Building System. Such systems do not replace the control of a Building System's components in relation to each other.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.
2. The work and services described by this Section and its further references are required by the Contract and shall govern all Division 20 and Mechanical Specifications on Mechanical Drawings (hereinafter "The Mechanical Divisions") as if repeated therein. It shall be performed by a dedicated subcontractor to the Mechanical Trade Contractor, and shall be one of the firms listed under "Qualifications" in this Section.
3. Comply with requirements of Section 200500 – Mechanical General Requirements, which form part of this Section as if repeated here.
4. Comply with requirements of Section 200501 – Basic Materials and Methods, which form part of this Section as if repeated here.
5. Contract requirements for testing, balancing, verification, and adjustment of mechanical Building Systems and their components are further described in Division 1, including but not limited to Sections 018010 and 019010, and in individual specification sections for the systems.

### 2. Intent

1. It is the intent of the Work of this Contract that all existing air distribution systems and equipment be re-balanced to ensure supply and return air values are continuing to be achieved. All fire dampers, whether existing or new shall be tested to confirm function.

### 3. Responsibility

1. In accordance with the requirements for responsibility for Building Systems as set out in Division 1, nothing in this specification shall relieve the Contractor, or the trade contractor for responsibility to achieve the contract and performance requirements of a building system. Such responsibility remains with the nominated trade contractor and the Contractor. See Sections 018010 and 019010.
2. All Building Systems affected by or part of the Work shall be tested, adjusted, balanced and verified for performance to meet design requirements through documented procedures that are accepted by the Owner and Consultant, without exception.
3. For each building system, the TABV agency must work in close cooperation with the responsible System Commissioner nominated to perform the Division 1 duties for the system, to achieve Division 1 requirements for co-ordination, start up, commissioning, and final commissioning of the systems.

### 4. References (conform to latest editions in each case)

1. Ontario Building Code.
2. Ontario Fire Code.
3. AABC - National Standards for Total System Balance.
4. ACG - AABC Commissioning Guideline.
5. ADC - Test Code for Grilles, Registers, and Diffusers.
6. ASHRAE 111 - Practices for Measurement, Testing, Adjusting, and Balancing of Building Heating, Ventilation, Air-conditioning, and Refrigeration Systems.
7. ASHRAE Guideline 0 The Commissioning Process,
8. ASHRAE Guideline 1 The HVAC Commissioning Process,
9. ASHRAE Guideline 1.1 HVAC&R Technical Requirements for the Commissioning Process,

10. ASTM E779 Determining Air Leakage Rate by Fan Pressurization.
11. NEBB - Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems.
12. SMACNA - HVAC Systems Testing, Adjusting, and Balancing.
13. SMACNA HVAC Systems Commissioning Manual

5. Submittals

1. Confirm name of TABV firm as part of the bidding process, as carried by the Mechanical trade Contractor. Submit qualifications of the individual(s) performing the work upon request of Consultant.
2. Field Reports: Indicate deficiencies in systems that would prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.
3. Prior to commencing work submit report forms or outlines indicating adjusting, balancing, and equipment data required.
4. Submit draft copies of report for review prior to final acceptance of Project. Provide final copies for Consultant and for inclusion in operating and maintenance manuals.
5. Submit detailed procedures, agenda, sample report forms and copy of AABC National Project Performance Guaranty prior to commencing system balance.
7. Test Reports: Indicate data on AABC National Standards for Total System Balance forms. Submit data in both imperial and S.I. Metric units.
8. All reports shall be prepared in electronic (computer) format using MS Word software and all tabulations shall be prepared in electronic (computer) format using MS Excel spreadsheet software. Submittals shall be in interactive ".pdf" formats on CD, DVD, or USB flash drive.

6. Qualifications

1. Balancing to be done under supervision of recognized expert with an established reputation in this field. A single independent agency specialist firm, employed under the Mechanical Trade Contractor, shall undertake all Mechanical Testing, Adjusting, Balancing, and Verification (TABV) work. This firm shall have performed similar work for the Consultant's mechanical engineering consultant in the past 3 years or be otherwise acceptable to the Owner and Consultant.
2. The firm that provides the work of this Section shall be one of:
  1. Air Audit
  2. C.J. Zettler & Associates
  3. D.J. Troupe & Associates, or
  4. Caltab.
2. The Mechanical Trade Contractor shall coordinate, supervise and cooperate with specialist during testing adjusting and balancing of Mechanical work. Systems Commissioners for each system as set out in individual system specification sections and Sections 018010 and 019010 shall work with the specialist firm for all work to the system for which they are responsible.

7. Costs

1. The Mechanical Trade Contractor shall include for all TABV, as be part of the Mechanical work.
2. Owner's Testing and Inspection Allowance in Division 1 shall not be used to pay for work described in this Section. Include all costs in the Contract Price, including all costs associated with general requirements described elsewhere in Division 1 for TABV and commissioning work. Any verification undertaken by the Owner's testing forces is a cross-check and supplementary to Contract requirements.

## 2. PREPARATORY WORK

1. Carry out site visits and attend commissioning workshop meetings during preliminary stages of construction to ensure that arrangements for TABV are incorporated.
2. Confirm proper placement of thermometer wells, test ports, pressure gauge cocks, balancing valves, balancing dampers and splitter dampers, and access doors.
3. Submit TABV schedule for each air system in the Work, with descriptive data outlining tests, procedures and sample forms showing method of data presentation, one month before start of TABV work on site. In addition to Division 1 requirements for such submittals, provide:
  1. Details of specific procedures to be used for determining test parameters from test measurements and criteria proposed to establish compliance with specification requirements.
  2. Lists of instruments to be used, method of instrument application (by sketch) and correction factors.
  3. Reference standards, design performance requirements, and regulatory requirements for each system.
4. Calibrate instruments in accordance with recognized standards, and submit calibration curves not more than three months before commencement of TABV.
5. TABV measurements may only commence when building is “closed in” and work is sufficiently advanced to include:
  1. Installation of ceilings, doors and windows.
  2. Application of sealing, caulking, and weather stripping.
  3. Normal operation of mechanical systems.
6. Do not commence TABV work associated with an equipment start up until Mechanical Trade Contractor has performed all required installation, to manufacturer’s written recommendations for the specific service condition.
7. Do not commence TABV work associated with a system until all equipment in that system has successfully achieved start up in accordance with the Contract, and all external connections to other systems have been made.
8. The TABV agency shall meet with the BMS Trade Contractor and review all BMS control of systems prior to beginning any TABV work. Perform work under both local control, and under BMS control. Do not rely upon BMS for TABV in any way.

## 3. SYSTEMS, EQUIPMENT AND RELATED CONTROLS REQUIRING TABV

1. All Building Systems involving air movement and handling.
2. All building systems involving water circulation, steam, hydronic flow, including but not limited to:
  1. Heating and cooling equipment and piping systems.
  2. Potable water equipment and cold, hot and recirculation hot water piping systems, and adjustment of all tempering mixing valves (at eyewashes and hot water heaters).
3. TABV work includes performing all manufacturer recommended checks to equipment, based on checklists and manufacturer’s written recommendations for the specific unit and service condition.
4. TABV work includes inspection and fin straightening in all heat transfer coils prior to handover of systems to Owner, and ensuring that all fin damage is repaired by the Mechanical Trade Contractor.

5. The TABV work includes verification of all gauges and instrumentation, both for items in the finished work and for agency's equipment used to perform tests, prior to performance of other TABV work upon which the instrumentation depends.
6. The TABV work includes vibration testing of all equipment involving motors, at bearing points for motor, for fan, at connections, and across all flexible connections. If non-complying, identify source and recommend corrective measures to be taken by the Mechanical Trade Contractor. Vibration testing of equipment operated by variable frequency drives shall be performed at several points on the performance curve, including 100%, and shall troll for vibrations arising from intermediate fan speeds.

#### 4. AIR MOVING SYSTEMS

##### 1. Parameters

1. Listed below is an outline of the information to be established in the TABV process:

1. Airflow related for air distribution system:
  - Pressure testing of all ductwork prior to connection to equipment;
  - Air volumes and velocities;
  - Flow cross section area;
  - Static pressure;
  - Velocity pressure;
  - Aiming of diffusers and grilles for optimum comfort and performance.
2. Temperature related for air distribution system and spaces:
  - Wet bulb;
  - Dry bulb.
3. Equipment related:
  - Vibration;
  - Motor and fan rotational speeds (rpm);
  - Electrical power;
  - Voltage;
  - Current draw.

2. Measurements are required at and around equipment and within air distribution systems to establish airside performance of:

1. Fans;
2. Coils;
3. Filters;
4. Dampers (fresh, return and relief);
5. Control Dampers
6. Diffusers and Grilles;
7. Air Conditioning Equipment;
8. All Roof top equipment in the Work
9. Ventilation Equipment

3. The work of this Section shall include review of all factory tests of mechanical equipment that are required by the Contract. In addition, measure and establish for each equipment:

1. pressure drops across coils and filters
2. fan inlet and discharge static pressure relative to ambient
3. fan input kW
4. fan supply air volume
5. fan speed

4. Measurements are required to characterize system performance:
  1. at HVAC equipment,
  2. at main ducts,
  3. at branch ducts,
  4. at sub-branch ducts,
  5. at each supply, exhaust and return air inlet and outlet,
  6. in each thermostatically controlled zone.
  
2. General Criteria
  1. Systems shall be balanced so that fans operate at lowest possible speed and static pressure consistent with delivery of specified air quantity at most remote system point.
  2. Supply fans shall be set-up with sufficient speed to deliver required air quantity when filters are loaded to manufacturers recommended maximum pressure drop.
  3. Air quantities at each exhaust system inlet and supply system outlet are to be measured and throw and pattern is to be adjusted at each supply outlet.
  
3. Fan Performance Assessment
  1. Air quantity to be measured by taking anemometer traverses across a coil or at a filter bank or by pitot tube traverse in a straight section of duct at fan suction or discharge.
  2. Static pressure difference between fan inlet and discharge, motor amperage and fan speed in rpm is to be measured and motor input power is to be determined from a curve showing power output as a function of motor amperage for the particular motor.
  3. Results of measurements to be plotted on fan characteristic curve supplied by fan manufacturer and the air volume, static pressure and fan speed lines should form a triangle enclosed by a rectangle with a dimension of not more than 15% of the rated static pressure by a dimension of not more than 10% of the specified air quantity. Input power taken from the fan characteristic should be within 10% of the power determined from the motor amperage readings.
  4. If required precision is not obtained, readings to be repeated. If subsequent testing shows that the required precision is unobtainable then fan manufacturer is to submit written report explaining actual fan performance and provide new characteristic curve showing actual performance for fan "as installed".
  5. Measure static pressure loss across cooling coils, heating coils and individual filter banks and tabulate readings with manufacturers published pressure loss figures for the actual measured air volume.
  
4. Outdoor Air Adjustment Procedure
  1. After adjustment of supply, return and related exhausts fans, adjust minimum outdoor air damper position to obtain design outdoor air quantities for ERV and H/C units.
  2. Damper position to be determined by measurement of outside, return and mixed air temperatures and confirming calculations to be included in balance report.
  
5. Branch Air Quantity Measurement Procedure
  1. Branch air quantities to be determined using pitot tube traverses in accordance with the procedures outlined in "Testing, Balancing and Adjusting of Environmental Systems" by William G. Eads, P.E., issued by SMACNA.

2. Measurements to be taken at each riser as it is connected to fan discharge or suction header and at each floor where branches are taken from the riser. Measurement to be repeated until sum of branch air quantities is within 10% of fan delivery.
6. Fire Dampers Test Requirements and Procedures
  1. Test all fire dampers and smoke control devices and certify proper operation. Test in conformance with requirements of the Ontario Building Code, (OBC), Ontario Fire Code (OFC), National Building Code (NBC) and Supplements thereto, the standards of the National Fire Protection Association (NFPA), and ASHRAE Guideline 5.
  2. Instruct installing Contractors on any adjustments necessary and retest until performance is satisfactory to building authorities is achieved.

## 5. REPORT PRESENTATION AND VERIFICATION

1. Accuracy
  1. Adjust systems until operating values within plus or minus 5% of design values are achieved. Measurements to be accurate to within plus or minus 2% of actual values.
2. Record-keeping
  1. Keep records of trial and final balance and submit preliminary report as each system is completed. Make spot checks as requested and repeat balancing of system if actual spot check quantities do not agree with preliminary report figures.
3. Report Format
  1. Arrangement to incorporate approved standard forms, with values expressed in {SI} and {Imperial} units.
  2. Include "as-built" system schematics showing flow quantities and measurement points. Use as-built drawings and ventilating line diagrams for references.
  3. Submit TABV reports as interactive pdf's on USB key and by electronic transfer, in accordance with Division 1 requirements.
  4. Report must be organized with separate sections for each Building System.
4. Verification
  1. Reported measurements shall be verified.
  2. Provide instrumentation & manpower to verify results of up to 30% of reported measurements.
  3. Number and location of verification measurements to be at discretion of Consultant.
  4. Where discrepancies are encountered repeat the entire TABV for the system. Resubmit reports.
5. Completion
  1. Continue to perform and re-perform TABV work until reports are accepted and performance of the systems is achieved. All costs for this work are included in the Contract Price.

## END OF SECTION

## 1 GENERAL

### 1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.
2. Comply with requirements of Section 200500 and 200501 as if repeated herein.
3. In addition to the above, particular contract requirements for the Facility Water Distribution Systems are described in this Section. Contract requirements related to this system may be described in other Sections and /or on drawings and in schedules, as follows:
  1. Components of this system;
  2. Requirements for related systems and components of related systems that provide inputs and outputs to this system; and
  3. Requirements for systems that are indirectly affected by this system.
4. This Trade Contractor shall inspect the bid forms. Provide all items requested and required by the bidding Contractor to provide completed bid forms prior to Tender closing and in the manner set out in Section 200500, Mechanical General Requirements.

### 2. Related Requirements

1. The Contractor and this Trade Contractor are specifically cautioned that Work requires achievement of the performance objectives for this building system described in Section 019010, Section 200500, Section 200501 and this Section. The Contractor and Plumbing Trade Contractor shall organize provision of the components of building systems to achieve the intent of the building system design, and shall provide all products and execution reasonable inferable as necessary to achieve the performance objectives and intent of the design.
2. The Contractor and this Trade Contractor shall thoroughly review all Sections of the specifications and all drawings, to ensure that the contract requirement for provision of a complete and functioning Facility Water Systems throughout the Work to locations where such systems are identified on drawings or in the specification is achieved.
3. The Contractor and this Trade Contractor shall:
  1. Provide construction to supply Products and materials in accordance with Section 016010 and execute the installation work in accordance with Section 017010 to meet the performance requirements for anticipated service life of the assemblies;
  2. Provide the design of connections and fasteners as set out in Section 017010; and
  3. Provide related services as set out in the general provisions of the Contract.
4. The following components of the Facility Water Systems are described elsewhere:
  1. Plumbing Fixtures and Trim Section 224200
5. The following related systems and components of related systems provide inputs to and receive outputs from the Facility Water Systems. They are described elsewhere as noted:
  1. Building Structural System receiving component loads Section 019550
  2. Sanitary Sewage System receiving output Section 221300
6. The Facility Water Systems indirectly affects the following systems and components described elsewhere:
  1. Millwork Division 06
  2. Interior Finish Systems, Painting and Finishing, and similar Division 09

7. Miscellaneous metal support of piping and components to the Building Structural System is described in this Section, but shall be accomplished by this Trade Contractor using materials and methods as additionally specified in Division 5 for Miscellaneous Metals where necessary to achieve support requirements.

### 3. System Intent

1. The intent of the Facility Water Systems, is to receive potable cold water under pressure from the site water supply system, condition, manage and distribute cold potable water throughout the building to all sinks, toilets, and equipment in isolation from the Sanitary Sewer System, all in accordance with applicable codes and standards. The system produces conditioned water using purification and softening equipment subsystems where indicated, hot water using water heating equipment, and similarly distributes this conditioned or hot water. The systems are new by this Contract. The system includes tempering valves at hot water heaters and further at eyewash stations to produce tempered domestic hot water at appropriate supply temperatures for devices downstream in each case. The subsystems include:
  1. Existing potable cold water supplies, for modification and extension to new and replacement plumbing fixtures and equipment;
  2. Existing potable hot water supplies, for modification and extension to new and replacement plumbing fixtures and equipment;
  3. Existing potable tempered water supply systems, for modification and extension to new and replacement plumbing fixtures and equipment.
2. In general, the Facility Water Systems includes but is not limited to the following components:
  1. An existing site water supply system, to remain;
  2. Connections to equipment, fixtures, devices and associated trim;
  3. Supported unburied pipes and fittings;
  4. Outflow devices, to suit construction conditions, and standard maintenance devices to provide for cleaning and maintaining the system;
  5. Distribution piping hydraulically designed to provide continuous, pressurized flow;
  6. Supports and fittings, to connect distribution piping, devices, and equipment, and transfer loads to the Building Structural System;
  7. Appurtenances and accessories to monitor, maintain, control flows, and supervise the system, including insulation of components to maintain thermal characteristics or guard against condensation on components of this system; and
  8. Existing equipment for heating, treating and conditioning the water.
3. The routing of the pressurised portions of this building system shall not take precedence over other building systems, where interference with proposed routing is encountered in the Work or in relation to existing conditions. Locate components of this building system to allow for proper function of this and all other building systems in accordance with Contract.
4. Components of this building system shall be located completed to the interior of the enclosure thermal barrier and vapour retarder systems, unless specifically indicated. All elements penetrating to the exterior shall include isolation valves, slopes to allow exterior portions to drain, and shall be fully sealed against ingress of water.

4. Existing Conditions
  1. Inspect and conform to the requirements for existing conditions, this project, and existing building as set out in Sections 002000, reference documentation, and Division 1.
5. Submittals
  1. Submit in accordance with Division 1 and Section 200500:
    1. Catalogue cuts and product literature of all products proposed for the work,
    2. Results of all preliminary and final pressure tests.
    3. Extended warranties on equipment and devices.
6. Coordination
  1. The Plumbing Trade Contractor shall co-ordinate the layout and installation of the water systems with other building systems and existing conditions in accordance with the order of precedence for systems set out in Sections 019010 and 200500.
  2. Cooperate with work described in other Sections to install the Water System so that it will not conflict with architectural, electrical, structural or other mechanical work.
7. Reference Standards and Codes
  1. Conform to requirements for reference standards and codes set out in Section 200500 and Division 1, including but not limited to the following applicable to this system:
    1. Local Fire and Building Department Requirements;
    2. Referenced engineering standards and recommendations in this Division and Division 1;
    3. The Ontario Building Code; and
  2. Conform to latest edition of all CSA Standards applicable to products and materials required for this Contract.
  3. Conform to the recommendations of the following National Research Council Canada Publications:
    1. NRCC NO. 30619, National Building Code of Canada; and
    2. NRCC No. 30625, Canadian Plumbing Code.
    3. ASME A112.26.1 - Water Hammer Arrestors.
    4. PDI WH-201 - Water Hammer Arrestors.
8. Quality Control
  1. Conform to requirements for quality control, standards of products, workmanship and services and to achieve tolerances as set out in Section 200500 and Division 1. All work shall be performed by plumbers licensed in the Place of the Work and experienced with the installation of products required by this Contract.
9. Temporary Facilities, Safety, Cleaning and Waste Management
  1. Conform and cooperate to ensure requirements for temporary facilities, safety, cleaning and waste management, and environment as set out in Section 200500 and Division 1 are achieved throughout the course of the Work.
10. Basic Product and Execution Requirements
  1. The work must be performed to meet the standards and requirements for supply and installation of products and materials, and related services, set out in Division 1, Section 200500, and Section 200501.

#### 11. Commissioning

1. Start-up, commissioning, and final commissioning are defined terms within this Contract, as described in Section 018010. Provide all such work to the system. No industry practice or common understanding shall detract from the definition of these terms as set out therein, or the requirement to perform start-up, commissioning, and final commissioning as set out in Division 1, Section 200500, and this Section.
2. Testing, balancing and verification activities described in Division 20 and required by this Contract are not intended to be the means and methods of commissioning the Facility Water Systems. The Plumbing Trade Contractor shall provide all services to commission the systems, in accordance with a commissioning plan for each system and checklists for equipment installation, as described in Division 01 and to the acceptance of the Consultant.

#### 12. Contract Closeout, Maintenance Manuals, & Maintenance Materials

1. Conform and cooperate to ensure requirements for contract closeout procedures, submission of manuals, and preparation of record documents as set out in Section 200500 and Division 1 are achieved.

#### 13. Warranties

1. Provide all warranties requested in Division 1, Section 200500, and this Section. Provide warranties strictly in the format set out in Division 1.
2. Mixing Valves shall be warranted for a period of ten (10) years.

#### 14. Building Systems Requirements

1. In addition to the Facility Water Systems, the work described by this Section is related to the other Building Systems as defined in Section 019010 and discussed elsewhere in this Section. Comply with requirements for performance, review, and co-ordination of such relations as set out in that Section.

## 2. PRODUCTS

#### 1. Devices

1. Trim for installation in plumbing fixtures is described on schedules and in Section 224200.
2. Stops for trim devices shall generally be supplied with the devices, tamper-proof.
3. Water Hammer Arrestors shall be provided on main runs in this contract. Hard drawn copper construction with precharged air chamber, Delrin PL pistons with Buna N "O" rings sized in accordance with manufacturer's recommendations. Acceptable products Watts "Shok-gard" SG, or equivalent by Zurn.
4. Non-freeze hose bibbs for new exterior locations: Watts HY-725 or equivalent, with key, length to suit wall construction and pipe configuration without any intrusion to interior of wall assembly, or equivalent Zurn Z1310.
5. Water Meter: Existing to remain.

#### 2. Pipes and Fittings

1. Pipe and fittings shall be in accordance with Mechanical Basic Materials and Methods, and as supplemented herein.

2. Domestic Water Distribution
  1. Above Floor: hard temper copper tube, type L, soldered, to ASTM B42-87, with wrought copper and bronze solder joint pressure fittings to ANSI B16.22-1980 or cast bronze solder joint fittings to ANSI B16.18 – 1973. Piping shall be third party certified and have permanent markings.
  2. Below Floor: soft drawn, seamless open copper tubing, type K to ASTM B88. Use of below floor piping shall only be allowed with specific written permission of Consultant.
3. Unions:
  1. 2" (50mm) and smaller: bronze or brass, 600 psi (4 MPa), solder joint:
    1. Jenkins Fig. 201CJ
    2. Red & White
    3. Crane
    4. Newman Hattersley
3. Hangers and Support - As described in Section 200501 Basic Materials and Methods.
4. Equipment
  1. Domestic Hot Water Heaters: exiting to remain u.n.o.
  2. Elevator Pit Sump Pump: exiting to remain u.n.o.
  3. Water Softening Equipment: exiting to remain u.n.o.
5. Accessories and Appurtenances – ALL TAMPER-PROOF TYPE
  1. Insulation: Insulation of piping is described in Section 200501 Basic Materials and Methods, to all locations in the specification or noted or indicated on drawings and schedules. Coordinate the division of this work with the Contractor where a separate insulating trade contractor is engaged to perform insulation work, so that required Work is not priced twice.
  2. Isolation Valves:
    1. 2" and smaller: bronze or brass, 600 psi WOG ball valve, solder joint and Teflon seats:
      1. Crane
      2. Red & White
      3. Jenkins
      4. Newman Hattersley
      5. MA Stewart
  3. Check Valves:
    1. 3" and smaller: bronze, 200 psi WOG swing check valve, solder joint:
      1. Crane
      2. Red & White
      3. Jenkins
      4. Newman Hattersley
  4. Drain Valves
    1. Locate at low points and at section isolating valves unless otherwise specified.
    2. Minimum NPS 3/4 unless otherwise specified: bronze, with hose end male thread and complete with cap and chain.

5. Drain Cocks:

1. 1/2" (13mm) hose end, ball valve with cap and chain, 600 psi cwp:

1. Jenkins, or equivalent by
2. Red & White
3. Crane
4. Newman Hattersley

6. Accessories and Fittings shall be further as noted on drawings or in schedules.

6. External Connections

1. Provide external connection to Sanitary System at each existing floor drain affected by the Work, primed from an adjacent plumbing fixture that is to remain in the finished Work. All costs for re-priming existing floor drains to suit code requirements are included in the Contract Price, including removal of slabs if necessary to re-prime.
2. Power wiring to equipment shall be by the electrical trade contractor, except heat tracing, which shall be arranged and paid for by this Trade Contractor. All wiring to control equipment in all respects for the intended performance of the system and sequence of operation shall be provided complete by this Trade Contractor, so that local control and manual control of the system can be maintained.
3. External connection of the hot water heater for combustion and flue gases shall be with power venting are existing, to be made good where affected by the Work of this Contract.

### 3. EXECUTION

1. Preparation

1. Prior to site mobilization, perform all general work and services required by Part 1 and Sections 200500 and 200501 to ensure acceptance of hydraulic design, products, and proposed execution.
2. Prior to installation, on site, lay out ALL exposed lines and device locations for Consultant's acceptance, and also concealed lines wherever conflict can occur. Revise piping and device locations as directed by Consultant.

2. General Installation

1. Installation of pipe and fittings shall conform to the Mechanical General requirements and Mechanical Basic Materials and Methods, and the following additional requirements.
2. Location of devices and lines shall be neat, in consistent relation to the building structural system rhythm and the requirements of architectural layouts.
3. Verify fully all systems as required to ensure proper operation of all devices, equipment and system capacity. Clean and adjust items to full extent for full operation of portions of system to be installed. Flush piping through all fixtures with aerators removed, until full system is flushed and clean. Re-install aerators after acceptance of water condition.

3. Devices

1. Installation of devices shall conform to the Mechanical General requirements and Mechanical Basic Materials and Methods, and the requirements set out in Section 224200 Plumbing Fixtures and Trim. Install stops and provide braided connections to fixtures generally.

2. Water Hammer Arrestors
  1. Provide water hammer arrestors ahead of each plumbing fixture group utilizing solenoid valves, flush valves, or other quick closing valves.
  2. Provide water hammer arrestors wherever else necessary to eliminate the risk of, and prevent, water hammer., and to all branch runs at a minimum.
3. Non-freeze hose bibbs
  1. Install NFHB's to suit the wall condition. Under no circumstances will it be acceptable that stems and associated connections protrude beyond the interior face of the wall, unless in mechanical room. The height and orientation of the NFHB must be co-ordinated with the cladding profiles on the exterior to ensure that the unit is mounted on the exterior portion of the cladding profile only. Adjust the height of the unit at time of cladding install. NFHB shall not rely upon the cladding for support. Provide means and methods of support behind the cladding to withstand abuse by users without damage to cladding. Provide sealant surround to flange at cladding using same sealant as cladding trade for colour match and performance.
4. Pipes and Fittings
  1. Install all necessary piping including fittings, unions, etc., to complete systems shown. Fittings shall be of equivalent bore as pipe, of equal strength and weight. Install piping to manufacturer's specifications and published directions. All piping shall conform to Building Code and further to more stringent requirements where specified. Pipe shall be copper unless noted otherwise.
  2. Clean and ream each joint and remove excess solder and flux where so joined.
  3. Install piping to provide adequate space and access for subsequent installation of pipe insulation.
  4. Grade horizontal water distribution piping 3 mm/m (1" in 30 feet) rising in direction of flow, wherever possible. Provide hose end drain valves at all low points and vent valves at high points of each of the water distribution subsystems (hot, cold, tempered, etc).
  5. Use dielectric couplings where piping of dissimilar metals connects. Shall be compatible with and to suit pressure rating of piping system.
  6. Pipes NPS2 and under shall be with isolating unions.
  7. Pipes NPS 2½ and over shall be isolating flanges.
  8. Provide felt or rubber gasket to prevent dissimilar metals contact.
  9. Install with due regard to expansion and movement, and potential for water hammer. Size sleeves, provide swing joints and configure piping to accommodate same.
  10. Tie-ins: where new branches are connected to existing mains and branch mains the method of connection shall be determined in the following order of preference, with the preferred method used wherever practically possible: highest preference, system shut-down and draining; next preference, hot tap; least preferred, pipe freezing.
  11. Where pipe freezing cannot be avoided, it must be performed by tradesmen experienced in the use of cryogenic pipe freezing systems. Each tie-in process shall be designed with due consideration of materials, pipe contents, and configuration.
  12. Joints: Clamped pierce-type joints and connections are not acceptable in any size connection. Make joints in copper water piping with 95/5 tin/antimony with lead-free solder with non-corrosive soldering flux.

13. Pipe Tests: Perform pipe tests to requirements of authorities, and report results in writing.
5. Hangers and Support
  1. See 200501 and conform thereto, except that hanger and support work must additionally conform to requirements stated in reference standards and codes. Provide piping tight to underside of building structure and secure to deck and walls.
  2. Support piping independently of equipment and accessories and to permit disconnection and removal without disruption of piping system. Locate valves, unions and flanges to permit easy removal of equipment with minimum removal of piping.
  3. Piping supports shall be size to allow insulation to pass through the support.
6. Equipment - N/A this Project
7. Accessories and Appurtenances
  1. Insulation: Insulation of piping is described in Section 200501 Basic Materials and Methods, to all locations in the specification or noted or indicated on drawings and schedules. Coordinate the division of this work with the Contractor where a separate insulating trade contractor is engaged to perform insulation work, so that required Work is not priced twice.
8. External Connections
  1. Pipe pressure relief valves to nearest adjacent funnel floor drain in copper. Route piping for least interference with equipment access and maintenance.
  2. Co-ordinate electrical power and control to hot water heaters and pumps. Provide all such control for manual and local operation, except line voltage power that shall be provided by the Electrical Trade Contractor.
  3. Where equipment is gas-fired, install venting after receiving approval of equipment manufacturer's representative of proposed routing, material and composition. Provide suitable weather cap at exterior.
  4. Install all other external connections as indicated on drawings and as required for completed building systems performance.
9. Testing and Commissioning
  1. Test and commission the Facility Water Systems in accordance with the prescribed requirements of Division 1 and this Division, to requirements of authorities having jurisdiction, and:
    1. Operate all systems to full capacity and verify proper, safe, efficient function of all components and of each complete system.
    2. Adjust flush tanks and valves of plumbing fixtures to give proper performance and to required settings.
11. Instructions to Operator
  1. Instruct Owner's Building Operator in care, maintenance and operation of this System and its components and relations to other systems. See 200500 & 200501 for further detail.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.
2. Comply with requirements of Section 200500 and Section 200501 as if repeated herein.
3. In addition to the above, particular contract requirements for the Sanitary Sewage System are described in this Section. Contract requirements related to this system may be described in other Sections of the specification and/or on drawings and in schedules, as follows:
  1. Components of this system;
  2. Requirements for related systems and components of related systems that provide inputs and outputs to this system; and
  3. Requirements for systems that are indirectly affected by this system.
4. This Trade Contractor shall inspect the bid forms. Provide all items requested and required by the bidding Contractor to provide completed bid forms prior to Tender closing and in the manner set out in Section 200500, Mechanical General Requirements.

### 2. Related Requirements

1. The Contractor and this Trade Contractor are specifically cautioned that Work requires achievement of the performance objectives for this building system described in Section 019010, Section 200500, Section 200501 and this Section. The Contractor and Plumbing Trade Contractor shall organize provision of the components of building systems to achieve the intent of the building system design, and shall provide all products and execution reasonable inferable as necessary to achieve the performance objectives and intent of the design.
2. The Contractor and this Trade Contractor shall thoroughly review all Sections of the specifications and all drawings, to ensure that the contract requirement for provision of a complete and functioning Sanitary Sewage System throughout the Work to locations where such systems are identified on drawings or in the specification is achieved.
3. The Contractor and this Trade Contractor shall:
  1. provide construction to supply Products and materials in accordance with Section 016010 and execute the installation work in accordance with Section 017010 to meet the performance requirements for anticipated service life of the assemblies;
  2. provide the design of connections and fasteners as set out in Section 017010; and
  3. provide related services as set out in the general provisions of the Contract.
4. The following components of the Sanitary Sewage System are described elsewhere:
  1. Pipe Insulation Section 200501
  2. Plumbing System Fixtures and Trim Section 224200
5. The following related systems and components of related systems provide inputs to and receive outputs from the Sanitary Sewage System. They are described elsewhere as noted:
  1. Building Structural System receiving component loads Section 019550
  2. Potable Water System equipment for pressure relief input Section 221100
6. The Sanitary Sewage System indirectly affects the following systems described elsewhere:
  1. Floor toppings and floor finishes establishing falls to floor drains Divisions 6 and 9
  2. Domestic Plumbing Systems (fixtures and equipment) Section 224200

7. Miscellaneous metal support of piping and components to the Building Structural System is described in this Section, but shall be accomplished by this Trade Contractor using materials and methods as additionally specified in Division 5 for Miscellaneous Metals, and to requirements of the Ontario Building Code.
3. System Intent
    1. The intent of the Sanitary Sewage System is to accept, collect and drain liquid waste and its related solids and convey them automatically and safely by gravity from the building to the Site Sanitary System, while organizing and controlling air entering the system for pressure-relief, and sewage gases, all in accordance with applicable codes and standards.
    2. In general, Sanitary Sewage Systems include but are not limited to the following components:
      1. Connections to equipment, fixtures and associated trim, as described elsewhere in this specification;
      2. Supported unburied and buried pipes and fittings, as described in 200501 and this Section;
      3. Inflow devices and drains, including trap primers, air gaps, and backflow prevention, to suit construction conditions, and standard maintenance devices to provide for cleaning and maintaining the system;
      4. Contributory piping system hydraulically designed to provide required and continuous gravity flow of liquid waste from devices, properly trapped and vented to ensure continuous flow, and properly installed to drainage falls;
      5. Supports and fittings, as described in Basic Materials and Methods, and this Section, to connect distribution and venting pipes and transfer loads to the Building Structural System;
      6. A venting subsystem of supported piping and fittings to allow introduction of pressure-balancing outdoor air into the system while containing and organizing the venting of sewer gases;
      7. Equipment components for interception of oil, grit, clay, or other contaminants that must be removed prior to allowing sanitary flow to exit the building, where such equipment is shown on drawings; and
      8. A main connection to the site sanitary sewerage system at a level as required to properly gravity-drain the system or as forced by pressure in a force-main subsystem, with backwater valve where specified or indicated.
    3. The routing of the gravity-drained portions of this building system shall take precedence over other building systems except other gravity-drained plumbing systems and the building structural system, where interference with proposed routing is encountered in the Work or in relation to existing conditions. Locate components of other building systems, and make alterations to existing building systems except gravity-fed and structural systems, to allow for proper drainage of the sanitary sewage system in accordance with Contract and requirements of applicable standards. Portions of the venting subsystem shall be concealed in the finished work unless in unfinished areas and mechanical rooms, and shall accommodate the required routing of other building systems.
  4. Existing Conditions
    1. Inspect and conform to the requirements for existing conditions, this project, and existing building as set out in Sections 002000, reference documentation, and Division 1.

2. Inspect the drawings and site in conjunction with the requirements of the specification and provide all routing work to accommodate the work of this Contract. Carefully establish required cutting and the patching of existing partitions, ceilings, and flooring assemblies and pay all costs for this work using other trade contractors qualified in the construction of such elements.
  3. Remove portions of the Sanitary Sewer System and made redundant by the removal of the equipment of other systems, and cap. Relocate piping, devices, and equipment of this system as required to suit all new work described in other Sections and for changes to other building systems, working in cooperation with the Contractor and other Trade Contractors.
5. Submittals
1. Submit in accordance with Division 1 and Section 200500 requirements:
    1. Catalogue cuts and product literature of all products proposed for the work,
    2. Results of all preliminary and final pressure tests.
    3. Extended warranties on equipment and devices.
    4. The name and authorization and qualifications of the individual who shall perform the Division 1 services including building system responsibility and be the system commissioner. The individual shall be the journeyman foreperson plumber licensed to install at the Place of the Work.
6. Coordination
1. The Plumbing Trade Contractor shall co-ordinate the layout and installation of the sanitary system with other building systems and existing conditions in accordance with the order of precedence for systems set out in Sections 019010 and 200500.
  2. Cooperate with work described in other Sections to install Sanitary System so that it will not conflict with architectural, electrical, structural or other mechanical work.
7. Reference Standards and Codes
1. Conform to requirements for reference standards and codes set out in Section 200500 and Division 1, including but not limited to the following applicable to this system:
    1. Local Fire and Building Department Requirements;
    2. Referenced engineering standards and recommendations in this Division and Division 1;
    3. The Ontario Building Code and applicable plumbing codes.
  2. Conform to CSA Standards as applicable to products and materials for this Contract, including but not limited to:
    1. CAN/CSA-B70-M91: cast iron soil pipe, fittings and means of jointing;
    2. B158.1-1976: cast brass solder joint drainage, waste and vent fittings;
    3. CAN/CSA-B181.1-M90: ABS drain, waste and vent pipe and pipe fittings;
    4. CAN/CSA-B181.2-M90: PVC drain, waste and vent pipe and pipe fittings; and
    5. CAN/CSA-B182.1-M92: Plastic drain and sewer pipe and pipe fittings.
  3. Conform to recommendations of the following National Research Council Canada Publications:
    1. NRCC NO. 30619, National Building Code of Canada; and
    2. NRCC No. 30625, Canadian Plumbing Code, in its latest edition.
8. Quality Control
1. Conform to requirements for quality control, standards of products, workmanship and services and to achieve tolerances as set out in Section 200500 and Division 1, including but not limited to the following applicable to this system:

1. Provide all tests and inspections necessary to confirm the conformance of the altered system to the applicable Codes.
  2. All work shall be performed by plumbers licensed in the Place of the Work and experienced with the installation of products required by this Contract.
9. Temporary Facilities, Safety, Cleaning and Waste Management
1. Conform and cooperate to ensure requirements for temporary facilities, safety, cleaning and waste management, and environment as set out in Section 200500 and Division 1 are achieved throughout the course of the Work.
10. Basic Product and Execution Requirements
1. The Trade Contractor performing the work described in this Section is specifically cautioned that such work must be performed to meet the standards and requirements for supply and installation of products and materials, and related services, set out in Division 1, Section 200500, and Section 200501.
11. Commissioning
1. Start-up, commissioning, and final commissioning are defined terms within this Contract, as described in Section 01810. Provide all such work to the system. No industry practice or common understanding shall detract from the definition of these terms as set out therein, or the requirement to perform start-up, commissioning, and final commissioning as set out in Division 1, Section 200500, and this Section.
12. Contract Closeout, Maintenance Manuals, & Maintenance Materials
1. Conform and cooperate to ensure requirements for contract closeout procedures, submission of manuals, and preparation of record documents as set out in Section 200500 and Division 1 are achieved.
13. Warranties
1. Provide all warranties requested in Division 1, Section 200500, and this Section. Provide warranties strictly in the format set out in Division 1.
14. Building Systems Requirements
1. In addition to the Sanitary Sewage System, the work described by this Section is related to the other Building Systems as defined in Section 019010 and discussed elsewhere in this Section. Comply with requirements for performance, review, and co-ordination of such relations as set out in that Section.

## **2 PRODUCTS**

1. Devices
  1. Supply hub drain components to all floor drains as required to receive condensate drains.
  2. Supply new devices as scheduled and noted on drawings, and as follows regardless of whether shown on drawings.
  3. Floor Drain (FD):
    1. Floor Drains
      1. Watts Drainage model FD-100-C-5.

2. ANSI A112.21.1; lacquered cast iron two piece body with double drainage flange, tapped for priming, weep holes, reversible clamping collar, and round, adjustable round nickel-bronze strainer with removable perforated sediment bucket.
4. Funnel Floor Drain (FFD):
  1. Watts Drainage Model FD-100-C-EG
  2. ANSI A112.21.1; lacquered cast iron two piece body with double drainage flange, tapped for priming, weep holes, reversible clamping collar, and round, adjustable nickel-bronze strainer with polished bronze elongated funnel.
3. Hub Floor Drain (HD):
  1. Watts Drainage Model FD-100-C-AS-7-8
  2. ANSI A112.21.1; lacquered cast iron two piece body with double drainage flange, tapped for priming, weep holes, reversible clamping collar, adjustable nickel-bronze angle strainer.
4. Trap Seal Primers
  1. Individual Traps:
    1. Watts Drainage model MS-810
    2. Automatic cast brass body, renewable disc and seat rings, vacuum breaker and removable cover.
5. Clean-Outs
  1. Interior Finished Floor Areas:
    1. Watts Drainage model CO-200-R
    2. Lacquered cast iron body with anchor flange, reversible clamping collar, threaded top assembly, and round gasketed scored cover in service areas and round gasketed depressed cover to accept floor finish in finished floor areas.
  2. Interior Finished Wall Areas:
    1. Watts Drainage model WUCO, CO-460
    2. Line type with lacquered cast iron body and round epoxy coated gasketed cover, and round stainless steel access cover secured with machine screw.
  3. Interior Unfinished Accessible Areas: Caulked or threaded type. Provide bolted stack cleanouts on vertical rainwater leaders.
  4. Line Cleanouts: lacquered cast iron Malcom type with cleanout ferrule, 1/2" (13mm) thick epoxy coated gasketed cover.
  5. Caulking for cleanouts: VOC content not to exceed 250g/L.
2. Pipes and Fittings
  1. Pipe and fittings shall be in accordance with Mechanical Basic Materials and Methods, and as supplemented herein.
  2. Unburied Sanitary Drainage Pipes:
    1. 50mm (2") and smaller diameter, hard temper copper tube, type DWV to ASTM B306-86, soldered, with wrought copper or copper drainage fittings to ANSI B16.29-1980 or cast brass drainage fittings to CSA B158.1-1976.

2. 75mm (3") and larger diameter, cast iron soil pipe, 4000# crush strength to ASTM A74-87, no-hub mechanical joint with neoprene gaskets and stainless steel pipe clamps with cast iron drainage fittings to CAN3-B70-M86.
3. Buried Sanitary Drainage Pipes:
  1. 50mm (2") and smaller diameter, hard temper copper pipe, type L, to ASTM B42-87, with wrought copper or copper alloy solder joint to ANSI B16.29-73 or cast brass solder joint to CAS B158.1-1976. Equivalent in DWV plastic as set out in Section 200501 is acceptable.
  2. 75mm (3") and larger diameter, cast iron soil pipe, 4000# crush strength to ASTM A74-87, no-hub mechanical joint with neoprene gaskets and stainless steel pipe clamps with cast iron drainage fittings to CAN3-B70-M86. Equivalent in DWV plastic as set out in Section 200501 is acceptable.
4. Condensate Drain or T&P R lines (from air handling units, water heaters, to hub or other drain)
  1. 3/4" (19mm) and 1" (25mm) type L copper. Equivalent in rigid PEX is acceptable.
  2. 1-1/4" (32mm) and larger annealed copper tubing, type DWV, to ASTM B306-86, soldered, with wrought copper or copper alloy drainage fittings to ANSI B16.29-1980 or cast brass drainage fittings to B158.1-1976.
5. Vents Pipes:
  1. Hard temper copper tube, type DWV to ASTM B306-86, soldered, with wrought copper or copper drainage fittings to ANSI B16.29-1980 or cast brass drainage fittings to CSA B158.1-1976. Equivalent DWV plastic as set out in Section 200501 is acceptable where building allows for combustible piping. Notwithstanding, provide non-combustible to all ceiling spaces used as plenums unless explicitly accepted by Authorities (plumbing and building inspectors both).
3. Hangers and Support - As described in Section 200501 Basic Materials and Methods.
4. Equipment - Not applicable this Contract.
5. Accessories and Appurtenances
  1. Insulation of piping is described in Section 200501 Basic Materials and Methods, to all locations in the specification or noted or indicated on drawings and schedules. Coordinate the division of this work with the Contractor where a separate insulating trade contractor is engaged to perform insulation work, so that required Work is not priced twice.
6. External Connections
  1. This contract includes connecting new portions of Sanitary Sewerage Systems to existing portions of Sanitary Sewerage Systems. Ensure all components are of new systems are fully compatible with existing.
  2. This Contract includes connecting the Sanitary Sewerage System to the building structural system for support.

### 3 EXECUTION

1. Preparation
  1. Prior to site mobilization, perform all general work and services required by Part 1 and Sections 200500 and 200501 to ensure acceptance of hydraulic design, products, and proposed execution.

2. Prior to installation, on site, lay out ALL exposed lines and device locations for Consultant's acceptance, and also concealed lines wherever conflict can occur. Revise piping and device locations as directed by Consultant.
3. The crossing of sanitary, storm or water mains over each other (whether in the site or building) shall be construed as critical and shall be given special attention as to installation, clearances, soil compaction and job supervision during the execution of the work. In any of the above crossovers there shall never be less than 150 mm (6") clearance between the pipes. Whenever such crossovers are being constructed, the Owner's Job Inspector shall be advised, so that he can witness this work, prior to backfilling.
4. Co-ordinate the depth of the sanitary system within the building so that it accommodates all trench drains, building foundation footings, and other features that cross the piping system. Do not begin installation until Contractor's superintendent and this trade contractor have reviewed and co-ordinated all crossings and established depths in relation to trenches and building structure. Under no circumstances can piping interrupt building footings. Piping passing under footings requires remedial measures and concreting to below the footing.

## 2. General Installation

1. Installation of pipe and fittings shall conform to the Mechanical General requirements and Mechanical Basic Materials and Methods, and the following additional requirements.
2. Verify fully all systems as required to ensure proper operation of all new devices, equipment and system capacity. Also clean and adjust systems to full extent for full operation to meet performance requirements.

## 3. Devices

1. Provide devices where indicated on architectural and plumbing floor plans. Inspect locations where floor drains are shown to determine that floor is sloped appropriately. Report concerns to Consultant prior to installation of drains.

### 2. Cleanouts

1. Do not install cleanouts in shower or washroom floors with resilient membrane floor finishes. Locate cleanouts elsewhere and adjust piping layout to suit.
2. Cleanouts shall be of same size as pipe up to 4" and not less than 4" for larger pipes.
3. Provide cleanouts where shown, and further at the end of mains and branches, at changes in direction, in long straight runs, at the base of all soil stacks and where required by Code, regardless of whether shown on drawings.
4. Use extended cleanouts for piping installed below grade and in furred ceiling spaces.
5. On floors with surface waterproofing membranes use only drains with surface membrane clamp and anchoring flange. It is not acceptable to cut out around the cleanout and glue the membrane to the floor.

### 3. Drains

1. Provide drains where indicated on architectural and plumbing floor plans.
2. Inspect locations where floor drains are shown to determine that floor is sloped appropriately. Report concerns to Consultant prior to installation of drains.
3. Coordinate installation with general trades and equipment locations.
4. Trap and vent all floor drains in accordance with Plumbing Code.

5. Provide trap seal priming for each trap serving floor drains, funnel floor drains, hub drains, and open end drains.
  6. Floor drains in floors with surface membranes shall be installed with a membrane clamp and anchoring flange.
  7. Embed traps and floor drains protruding below concrete slabs on grade entirely in concrete. Piping passing through such floors shall be surrounded with sufficient concrete to make the installation watertight, and prevent ground water from seeping between the metal and concrete.
  8. Ensure that below slab piping and conduit runs do not interfere with trench drain routing and depths, including depth of concrete surround to underside of drain.
  9. This trade contractor shall be present during concrete pours for all trench drains, to ensure proper installation of concrete and that drain remains properly positioned.
  10. For drains located in membrane finished floors, the membrane shall be installed over the drain without interruption, and all joints and welds completed prior to cutting for drain cover installation. Accurately cut membrane so that membrane overlaps fully between frame and mechanically fastened cover. Locate fastener holes by installing threaded pins to fastener positions prior to membrane installation, and pierce membrane at fastener locations for minimal size holing. Remove pins and install drain cover with fasteners dipped in sealant compatible with floor finish membrane.
  11. For drains located in tile finished floors, co-ordinate frame location with tile pattern for even relation of drain to tile jointwork.
4. Trap Seal Primers
1. The preferred method to prime traps is by connecting to the flush tube of flush valve or tank fixtures or from the waste of an interior drinking fountain.
  2. Condensate drains from cooling units may not be used to prime traps.
  3. No more than 3 traps may be primed by one drinking fountain, flush valve, or tank flush tube.
  4. Where a drinking fountain or flush valve is not advisable, or where no means is shown to prime traps, provide a trap seal primer ensuring manufacturer's installation instructions are followed. Propose location for acceptance of Consultant prior to installation. Pay all costs for this trap seal primer and its installation. Group trap primers shall be provided where specifically shown and where agreed with the Consultant.
4. Pipes and Fittings
1. Install all necessary piping including fittings, unions, etc., to complete systems shown. Fittings shall be of equivalent bore as pipe, of equal strength and weight. Install piping to manufacturer's specifications and published directions. All piping shall conform to Building Code and further to more stringent requirements where specified.
    1. Install piping to allow for expansion and contraction complete with swing joints as necessary.
    2. Install piping with necessary falls for condition.
    3. At connections of new to existing piping of different composition, provide approved joint fittings purpose-made for permanent connection of such disparate types of pipe.

## 2. Piping Installation – Below Ground

1. Set out any required cutting and patching for minimum impact on existing slabs on grade and assemblies generally. Proposed cutting of trenches in existing floor slabs must be reviewed and accepted by Consultant prior to beginning floor slab work.
2. Accurately verify location and inverts of all existing services before starting work. Check sanitary and storm sewer outlet connection points both inside and outside building before any sewer work is started. Start installation of sewer lines at outlet invert to ensure connection can be met.
3. In no case shall the system be laid out or installed for minimal depth below highest devices in below grade piping. Ensure minimum 200 mm additional depth for all 100 mm lines at top of system, for future addition.
4. Ensure piping depths to below grade piping are suitable for clearance of all devices and fixtures set in slab, such as trench drains and recessed mop sinks.
5. Grade bottom of pipe trenches to maintain design slopes. Lay pipes directly on competent undisturbed soil, ensuring even bearing along pipe length. In unstable soil and fill, provide 2500 psig (17.2 MPa) concrete cradles or piers to undisturbed competent stratum in accordance with Ontario Building Code Part 7.
6. Inspect all pipe and fittings for damage prior to installation. Do not install damaged products or materials.
7. Handle, lay, bed, join and cover pipes carefully and in such manner as to preclude any possibility of damage thereto.
8. Lay and join pipes in strict accordance with written manufacturer's instructions, all codes and standards, and generally as follows:
  1. In straight lines and to required even grades.
  2. Clean pipe thoroughly before laying and protect from dirt and water infiltration.
  3. Support pipe in the manner indicated, class "B" bedding if not shown or noted otherwise. Provide suitable pockets for the bells or coupling of pipe, so that the total length of the bottom segment of the pipe barrel is evenly and firmly supported.
  4. Where pipes enter or leave manhole or other structure, support them on compacted crushed stone bed or concrete cradle through the backfilled area. The pipe support shall extend laterally from undisturbed soil to the face of wall through which the pipes pass.
9. Install ABS and PVC DWV drain, waste, vent pipe and fittings in accordance with manufacturer's instructions, CSA B181.11 or B182.12 as applicable in their latest editions, and Ontario Building Code Part 7, for most stringent requirement in each instance.
10. Completely surround plastic piping in ground by at least 100 mm of non-cohesive pallast material of which at least 50% will pass a 6 mm sieve and 100% will pass a 13 mm sieve, and that is sufficiently consolidated so that the intended earth loading will not produce further compaction.

## 3. Piping Installation – Above Ground

1. Co-operate with other trade contractors whose work affects or is affected by work described in this Section, to ensure satisfactory installation and to avoid delays. Provide all materials to be built-in such as sleeves, anchors, etc, together with accurate dimensions or templates, promptly.

2. Lay out all work accurately, installing piping parallel to lines of building.
  3. Install vertical runs of piping, wherever possible, in partitions and interior walls. Do not install horizontal runs of piping in partitions and walls unless alternative is for exposed piping in the finished work. All partitions and walls shall retain maximum flexibility for future new openings.
  4. Install piping generally to concealed ceiling areas and avoid exposed ceiling areas wherever possible. Install concealed piping close to building structure to minimize hangers and furring dimensions.
  5. Do not install piping within exterior walls beyond the line of the thermal barrier system and vapour retarder system unless specifically shown and noted on drawings.
  6. Grade horizontal drainage piping 20 mm per m or piping 75 mm and smaller and 10 mm per m for piping larger than 75 mm wherever possible.
  7. Where piping passes through concrete floors, or walls, sleeves shall be sized to permit the pipe to expand freely without binding or crushing pipe, and with sufficient space for insulation and firestopping to ULC tested and approved configurations.
  8. Provide trapped condensate drain from each drain pan that is serving cooling coils or humidifier sections and pipe to nearest open hub or funnel floor drain.
4. Piping Joints
1. Make joints in copper waste, vent and water piping with 95/5 tin/antimony with lead-free solder with non corrosive soldering flux.
  2. Make joints in cast iron piping with standard M-J joints in accordance with manufacturer's recommendations and CSA B70 in its latest edition.
  3. Make piping joints in plastic piping in accordance with manufacturer's written instructions.
  4. On PVC sewer pipe make solvent cement joints in accordance with CSA B182.11-1987.
  5. Install piping to allow for expansion and contraction c/w swing joints as necessary.
5. Perform pipe tests to requirements of authorities, and report results in writing. At minimum test drainage and vent piping in accordance with Plumbing Code, and Ontario Building Code. Arrange and pay for inspections by the local plumbing inspection authority. Comply with all instructions resulting from such inspections at no cost to Owner.
5. Hangers and Support
1. See 200501 and conform thereto, except that hanger and support work must additionally conform to requirements stated in reference standards and codes and all above grade piping must comply with OBC requirements for restraint and support. Plastic piping shall be supported at minimum 4'-0" (1200 mm) on centre unless piping is larger than 2 1/2" (64 mm), in which case support to minimum 5 feet on centre (1500 mm).
  2. Support piping independently of equipment to permit disconnection and removal without disruption of piping system. Locate valves, unions and flanges to permit easy removal of equipment with minimum removal of piping.
6. Equipment - Not applicable this Contract

7. Accessories and Appurtenances

1. Insulation: Insulation of piping is described in Section 200501 Basic Materials and Methods, to all locations in the specification or noted or indicated on drawings and schedules. Coordinate the division of this work with the Contractor where a separate insulating trade contractor is engaged to perform insulation work, so that required Work is not priced twice.

8. External Connections

1. Condensate drain piping or T&P R lines from equipment of other building systems to hub drains is by the Trade Contractor providing such systems.
2. Trap primers shall be connected to nearest plumbing fixture suitable for source of priming. Where such a source is not available, provide priming kit and install complete to the potable water system.

9. Testing and Commissioning

1. Test and commission Sanitary Sewage System in accordance with the prescribed requirements of Division 1 and this Division, and call for and obtain all inspections by authorities having jurisdiction.
2. Operate and pressure test all systems to full capacity and verify proper, safe, efficient function of all components and of each complete system, to satisfaction of authorities.
3. All drainage shall be tested and verified by this trade contractor through witnessed test of introduction of water at all devices simultaneously.
4. Provide services during and after installation as set out in Part 1.

10. Instructions to Operator

1. Instruct Owner's Building Operator in care, maintenance and operation of the Sanitary System and its components and relations to other systems. See 200500 and 200501 for further detail.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division One, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.
2. Comply with requirements of Section 200500, Mechanical General Requirements, which form part of this Section as if repeated here.
3. Comply with requirements of Section 200501, Basic Materials and Methods, which form part of this Section as if repeated here.
4. In addition to the above, particular contract requirements for the Potable Water System and Sanitary Sewage System are described in Sections 221100 and 221300 respectively. Contract requirements related to fixtures may be described in other Sections of the specification and/or on drawings and in schedules, as fixtures and trim form components of both supply and waste systems, and this Contract requires that fixtures be installed to conform to the requirements set out in both the Potable Water and Sanitary Sewage systems, so that performance of each system is achieved.
5. This Trade Contractor shall inspect the bid forms. Provide all items requested and required by the bidding Contractor to provide completed bid forms prior to Tender closing and in the manner set out in Section 200500, Mechanical General Requirements.

### 2. Requirements Forming Part of the Work of this Section

1. Inspect and conform to the requirements for existing conditions as set out in Sections 002000, reference documentation, and Division 1.

### 3. Submittals

1. Submit in accordance with Division 1 and Section 200500 requirements, and complete detailed shop drawings for each type of plumbing fixture.

### 4. Coordination

1. Co operate with work described in other Sections to install the Plumbing Fixtures and Trim so that it will not conflict with architectural, electrical, or other mechanical work.

### 5. Standards and Codes

1. Provide work in accordance with requirements of Regulatory Agencies and conform to:

1. CAN/CSA-B125-M89: Plumbing Fittings
2. CAN/CSA-B45.0-88: General Requirements
3. CAN/CSA-B45.1-88: Vitreous China
4. CAN/CSA-B45.2-88: Enamelled Cast Iron
5. CAN/CSA-B45.3-88: Porcelain Enamelled Steel
6. CAN/CSA-B45.4-88: Stainless Steel
7. CAN/CSA-B45.5-88: Plastic
8. CAN/CSA-B651-M90: Barrier-Free Design

6. Conform to requirements for quality control, standards of products, workmanship and services and to achieve tolerances as set out in Section 200500 and Division 1, including but not limited to the following applicable to this system:

1. Work to the Plumbing Fixtures and Trim shall be performed by qualified plumbing fitters having a minimum of three years of certified experience, certified at the Place of the Work.

2. Acceptable manufacturers shall be as scheduled and as further set out in this Section.
7. Conform and cooperate to ensure requirements for temporary facilities, safety, cleaning and waste management, and environment as set out in Section 200500 and Division 1 are achieved throughout the course of the Work.
8. The Trade Contractor performing the work described in this Section shall meet the standards and requirements for supply and installation of products and materials, and related services, set out in Division 1, Section 200500, and Section 200501.

9. Basic Product Requirements

1. Water Efficiency

1. The flow rates of fittings that supply water to a fixture shall not exceed the maximum flow rates at the test pressures listed in the table as follows:

FITTINGS	MAXIMUM FLOW		TEST PRESSURE	
	CAN.gpm	(L./min)	Psi	(kPa)
Lavatory Faucet	1.50	(8.35)	60	(413)
Kitchen Faucet	1.84	(8.35)	60	(413)
Laundry tub Faucet	1.84	(8.35)	60	(413)
Mop sink trim	as Scheduled			
Emergency Eyewash	as Scheduled			

2. The Flush cycle for each fixture that is a water closet or urinal, shall not exceed the maximum flush cycle listed in the table as follows:

FIXTURES	MAXIMUM FLUSH	
	CAN GAL.	(L)
Water Closet	1.27	(4.8)

10. Commissioning

1. Start-up, commissioning, and final commissioning are defined terms within this Contract, as described in Section 018010. Provide all such work. No industry practice or common understanding shall detract from the definition of these terms as set out therein, or the requirement to perform start-up, commissioning, and final commissioning as set out in Division 1, Section 200500, and this Section.
2. The Work includes all construction and related services to test, commission, and identify the installed plumbing fixtures and trim as components of other systems as noted herein.

11. Closeout

12. Conform and cooperate to ensure requirements for contract closeout procedures, submission of manuals, and preparation of record documents as set out in Section 200500 and Division 1 are achieved.

12. Warranty

1. Provide all warranties requested in Division 1, Section 200500, and this Section. Provide warranties strictly in the format set out in Division 1.

13. Building Systems Requirements

1. The work described by this Section forms components in the following Building Systems as defined in Section 019010. Comply with requirements for the integration of the work described in this Section into its roles in the various systems. Provide the work so that the performance requirements of the overall system of which it forms part is achieved. Trade contractors shall

not proceed in uncertainty regarding the role or requirement of the component in relation to the system. Obtain clarification from the Contractor and the Trade Contractor responsible for the system, as set out in Section 019010:

1. Potable Water Supply System
2. Sanitary Sewage System
3. Barrier-Free Path of Travel System
4. Electrical Distribution System

## 2. PRODUCTS

### 1. General Requirements

1. Products for fixtures and trim shall be as scheduled on drawings, and as further described here.
2. Tag fixtures and trim at shop with identification indicating proper location for installation.
3. Deliver, store and handle components so as to prevent damage, distortion and corrosion. Store components off the ground and under cover in a dry protected area.
4. Stop valves are required at all fixtures. All escutcheons and wall plates shall be cast brass, chrome-plated, set screw type and stainless steel, and other approved non-corrosive material. All items must bear name of manufacturer or identifying trademark.
5. No fixtures or fittings of white metal or of a zinc composition shall be acceptable. This item shall be strictly adhered to.
6. Prior to confirming order for fixtures, the Plumbing Trade Contractor and Contractor must verify with the Millwork Trade Contractor that all sinks and lav's are compatible with millwork and architectural woodwork as detailed and specified. No additional cost shall be considered where products or millwork require revision or replacement to accommodate the particulars of the work of either Trade Contractor. In the case of required changes, no restocking charges or change to contract schedule will be accepted as part of the contract change.
7. Hard-wired transformers for electronic sensors may be ganged where sensors are within 4.5 m of transformer location.
8. Fixtures and trim shall be free from flaws or blemishes. Surfaces shall be clean, smooth and bright, have dimensional stability and be guaranteed not to discolour, craze or crack. Visible parts of fixture supply trim shall be chrome plated.

### 2. Water Closets (WC)

1. As Scheduled on Drawings, American Standard or accepted equivalent as further set out below.
2. Floor mounted, vitreous china, elongated bowl, lined tank. Install as per barrier free requirements using flex connect braided hosing. Provide flange bolts and gasket. Supply all water closets with stops. Toilet Seat, to suit toilet, heavy duty anti-microbial solid plastic open front with cover, black Centoco. Supply with reinforced stainless steel check hinge, posts, washers and nuts. Water Closet to have minimum 800 MaP rating.
3. Supplies shall be chrome plated, angle closet supply, lockshield screwdriver slot, stuffing box cartridge, brass supply nipple, 13mm (1/2" OD x 305mm (12") long flexible riser, stainless steel wall flange.
4. Ensure hand-flush operators are located on open side of the toilet (i.e. not against the side wall). Contractor and Mechanical Trade Contractor shall coordinate handing to suit water closet locations.

3. Flush Valves – Not Used this Project
4. Lavatories (LV)
  1. As Scheduled on Drawings, American Standard or accepted equivalent as further set out below.
  2. Lavatories shall be wall-mounted complete with floor-mounted fixture carrier. Waste shall be 1 1/4" outside diameter, chrome plated cast brass drain with offset open grid strainer. Supplies shall be chrome-plated, angle lavatory supply, lockshield screwdriver slot, stuffing box cartridge, brass supply nipple, 1/2" OD x 12" long flexible riser, stainless steel wall flange.
  3. Provide purpose-made vitreous china SAN and supply piping covers to hide all piping from view in the finished work, and to protect all piping and shutoffs from damage that may be caused by shelter residents.
  4. All faucets shall be Delta Commercial Teck® metering handwash faucet, or accepted equivalent. Faucets shall be heavy-duty cast-brass construction, vandal resistant, single-hole mounting, polished chrome-plated finish, push button lever controls, metering slow-close cartridge, mixing tee and inlet checks, vandal-resistant flow-control non-aerating spray outlet, and heavy-duty cover plate.
5. Stainless Steel Sinks (S or SS)
  1. As scheduled on Drawings, Franke Commercial or accepted equivalent as further set out below. Sinks shall be single or double-compartment as indicated, c/w ledge. All faucets shall be Delta Commercial 100LF-HDF chrome trim, c/w trap, crumb strainer, supplies, and stops.
6. Showers (SH)
  1. Prefabricated Shower Units
    1. Acceptable Manufacturers: Longevity, Mirolin, or equivalent by submission to the Consultant during the Bid period.
    2. Prefabricated Shower Units shall be to the dimensions indicated on Schedules on Drawings, with drain position to suit existing drain position, and as follows:
      1. Designed for heavy-duty, Institutional applications;
      2. One-piece, high quality, non-porous acrylic;
      3. Reinforced base;
      4. Front edged with drip for non-barrier free locations, max. 1/2" bevelled front ledge for barrier-free locations, and to AODA requirements;
      5. Non-slip textured floor surface;
      6. No pre-formed shower seat or towel bar;
      7. With molded self-draining soap shelf;
      8. Complete with trap, and shower drain, chrome.
      9. Grab bars to Barrier-Units: in accordance with Section 102800
      10. Adjustable Barrier-Free Shower Seat: where indicated on Drawings, provided separately, in accordance with Section 102800
  2. Shower Controls and Trim
    1. Acceptable Manufacturers: Simmons or equivalent, heavy duty trim, by submission to the Consultant during the Bid period.
    2. Provide new trim and controls to all showers, whether existing or new, and unless specifically noted otherwise. Thermostatic mixing valve, and push button metering shower trim shall be suitable for existing wall depth and mounting conditions: Symmons 4-420 shower valve and trim kit + WATTS 1170LF mixing valve.

3. Shower Head (Non Barrier-Free): wall-mounted, 1.75 GPM, chrome, integral stops.
4. Shower Head (to all Barrier-Free Locations): 1.5 GPM handheld shower held, integral check valve, 82" metal metal hose, 36" (915mm) long slide bar, wall supply elbow, chrome, integral stops.
7. Mixing Valves
  1. Provide faucet manufacturer recommended thermostatic mixing valves to all lavatories and sinks in shared or "public" use washrooms.
8. Mop Sinks – As Scheduled
  1. Fiat or equivalent, molded mop sinks
  2. Provide Delta Commercial trim complete with wall bracket as scheduled. Provide mop holder in stainless steel, 1 m of hose, and hose bracket, as scheduled.
9. Eyewash Fountain – as Scheduled
  1. Units shall be supplied and installed with thermostatic mixing valve.
10. Laundry Tub – as Scheduled
  1. Provide single compartment, barrier-free, wall-hung laundry tub with integral splash-back. Trim as scheduled. Provide complete with wall hanger, and side panels to hide all domestic water supply and sanitary connections. Off-set trap.
11. Alternative Manufacturers
  1. Water Closets: Kohler, Mansfield, Crane, Zurn
  2. Lavatories: Kohler, Mansfield, Crane, Zurn
  3. Faucets: Moen, Zurn
  4. Supply Fittings: Powers, Delta, McGuire
  5. Stainless Steel Sinks: American Standard, Novanni, Blanco
  6. Emergency Eyewash Stations: Guardian, Bradley

## 2. EXECUTION

1. Preparation
  1. Prior to site mobilization, perform all general work and services required by Part 1 and Sections 200500 and 200501 to ensure acceptance of products and proposed execution.
  2. Prior to installation, on site, lay out ALL fixture and trim locations for Consultant's acceptance. Revise locations as directed by Consultant.
  3. Verify mounting height of all fixtures with Consultant before rough-in.
  4. Ensure all blocking and support is installed to wall for lav and trim support, working in conjunction with partition trades and carpentry trade and Contractor.
  5. Provide templates and layouts to the applicable trades, including for fixture carriers. Ensure fixture carriers, trim bodies, and other elements to be built into walls are supplied in a timely manner to the site, for incorporation into the Work without delay to the schedule.
2. General Installation
  1. Provide all necessary accessories, gaskets, compounds and materials to install fixtures and trim.

2. Schedule installation of fixtures and fittings to co-ordinate with millwork installation, ensure blocking and support within partitions and walls, and co-ordinate installation with finishing of adjacent wall and floor finishes.
  3. Provide a template and location instruction to rough carpenter and millwork trade contractor for all fixtures installed in millwork.
  4. Ensure that plumbing rough-ins allow for installation of millwork and fixtures without interference or notching.
  5. Install fixtures and trim in strict accordance with manufacturer's instructions for best function in the specific condition of service.
3. Roughing-in of Fixtures
    1. Co-ordinate rough-in for fixtures as described in other Sections so that rough-in is properly aligned and provided complete with valves, supplies, wastes and vents, capped.
4. Installation of Fixtures
    1. Connect fixtures complete with supplies and drains, supported level and square, hot water faucets shall be on the left. Fixtures on outside walls to have supplies from floor; or as indicated on drawings, other fixtures to be served from the wall.
    2. Mounting heights for wall hung fixtures and showers measured from finished floor: Comply with OBC requirements unless otherwise indicated or specified by Consultant.
    3. Provide and secure in place fixture carriers for wall hung fixtures.
    4. Install plumbing fixtures level and plumb relative to finished floors and/or wall surfaces.
    5. Accurately lay out all roughing-in as no offsets will be accepted.
    6. Use chrome plated items for all visible parts of the fixture trim including faucets, escutcheons, waste, strainers, traps, supplies, stops, etc.. Split escutcheons shall not be used. Co-ordinate escutcheon installation with plumbing rough-in and work to substrates.
    7. Provide and install all accessories and optional features indicated to be supplied with the fixtures, and further as supplied with the fixtures.
    8. Provide offset wastes for all fixtures designated for handicapped application to allow for required clearance under fixtures.
    9. Insulate exposed surfaces of waste connections, traps and supplies of handicapped fixtures, refer to Thermal Insulation for Piping in Basic materials and Methods Section.
    10. Adjust operation of water closets to provide specified water flow rate based on manufacturers calibration data, and not to exceed Ontario Building Code limits.
  5. Barrier Free Use
    1. Rough-in and install plumbing fixtures at recommended height for normal or handicapped use, per OBC Barrier-free requirements.
    2. Water closets:
      1. Seat located between 400 and 460 mm above the floor, as per OBC
      2. Horizontal position is between 460 and 480 mm between centerline of fixture and at least one adjacent side wall, as OBC.

3. Lavatories:
  1. Top not more than 840 mm above floor, as per OBC
  2. Horizontal not less than 460 mm from centerline of fixture & side wall, to OBC
  3. Insulate exposed supplies and drain lines
3. Wall Hung Lavatories
  1. Install hanger brackets supplied with fixtures to wall with 10 mm bolt studs welded to steel anchor plates embedded within wall.
  2. In locations where a pipe space is provided behind wall, extend bolt studs through wall and anchor with steel back-plates. Ensure proper placement and positioning of anchor plates and bolt studs during wall construction.
6. Testing and Commissioning
  1. Operate all portions of systems to full capacity and verify proper, safe efficient operation of all parts and of complete system. Adjust valves to provide adequate flush with minimum water.
  2. Test to Code requirements. Repair all leaks to the inspection authority and / or the Consultant's acceptance. After systems have been tested and repaired, repeat tests.
  3. Provide installation report certifying compliance with applicable codes & regulations to Consultant.
  4. Provide services during and after installation as set out in Part 1.
8. Clean all plumbing fixtures and equipment.
9. Do not permit use of plumbing fixtures.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division One, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.
2. Comply with requirements of Section 200500 – Mechanical General Requirements, which form part of this Section as if repeated here.
3. Comply with requirements of Section 200501 – Basic Materials and Methods, which form part of this Section as if repeated here.
4. In addition to the above, particular contract requirements for the Gas Distribution System are described in this Section. Contract requirements related to this system may be described in other Sections of the specification and/or on drawings and in schedules, as follows:
  1. Components of this system,
  2. Requirements for related systems and components of related systems that provide inputs and outputs to this system,
  3. Requirements for systems that are indirectly affected by this system.
5. This Trade Contractor shall inspect the bid forms. Provide all items requested and required by the bidding Contractor to provide completed bid forms prior to Tender closing and in the manner set out in Section 200500, Mechanical General Requirements.

### 2. Related Requirements

1. The Contractor and this Trade Contractor are specifically cautioned that Work requires achievement of the performance objectives for this building system described in Section 019010, Section 200500, Section 200501 and this Section. The Contractor and Gas Trade Contractor shall organize provision of the components of building systems to achieve the intent of the building system design, and shall provide all products and execution reasonable inferable as necessary to achieve the performance objectives and intent of the design.
2. The Contractor and this Trade Contractor shall thoroughly review all Sections of the specifications and all drawings, to ensure that the contract requirement for provision of a complete and functioning Gas Distribution System throughout the Work to locations where such systems are identified on drawings or in the specification is achieved.
3. The Contractor and this Trade Contractor shall:
  1. provide construction to supply Products and materials in accordance with Section 016010 and execute the installation work in accordance with Section 017010 to meet the performance requirements for anticipated service life of the assemblies;
  2. provide the design of connections and fasteners as set out in Section 017010;
  3. provide related services as set out in the general provisions of the Contract.
4. The following components of the Gas Distribution System are further described elsewhere:
  1. Existing gas services as shown on building mechanical drawings.
5. The following related systems and components of related systems provide inputs to and receive outputs from the Gas Distribution System. They are described elsewhere as noted:

1. Building Structural System receiving component loads	Section 019550
2. Gas Service from Utility providing input and metering	Existing to remain
3. Envelope Roofing System receiving component loads	Division 7
4. Domestic water system heaters receiving gas output	Existing to remain

5. Hydronic Heating System receiving gas output Section 232100
  6. Air Distribution System Units receiving gas output Section 233000
  6. Miscellaneous metal support of piping and components to the Building Structural System is described in this Section, but shall be accomplished by this Trade Contractor using materials and methods as additionally specified in Division 5 for Miscellaneous Metals.
  - 7 Identification and marking of gas piping in accordance with CSA B149.1.
3. System Intent
1. **The intent of the Gas Distribution system is to safely disconnect and reconnect existing gas service to all existing roof-top equipment consuming such gas, in order to support re-roofing operations, all in accordance with Code and Regulation requirements, as supplemented by further and more stringent requirements of this Contract.**
  2. In general, the Existing Gas Distribution System includes, but is not limited to, the following:
    1. Pipes and fittings conveying gas to equipment consuming such gas on building roofs;
    2. Valves and devices that isolate, balance and control the gas flow to such units;
    3. Brackets, fasteners, roof-mount pads, saddles, and accessories for pipes and fittings; and
    4. Identification and marking of the system.
  3. The routing of all other building systems shall take precedence over gas distribution system routing where interference with proposed routing is encountered in the Work or in relation to existing conditions. Locate gas distribution piping to accommodate and ensure that other building systems can be installed without interference.
4. Existing Conditions
1. Inspect and conform to the requirements for existing conditions, this project, and as set out in Section 200500.
  2. De-energize and re-energize all affected natural gas systems to permit any reworking of installations where such installations require modification because of defect or deficiency, at no further cost.
5. Submittals
1. Submit in accordance with Division 1 and Section 200500: and, copies of gas installation certification that is affixed to the Work.
6. Co-ordination
1. The Gas Trade Contractor shall co-ordinate the layout and installation of the gas system with other building systems and existing conditions in accordance with the order of precedence for systems set out in Sections 019010 and 200500.
7. Reference Standards and Codes
1. Conform to requirements for reference standards and codes set out in Section 200500 and Division 1, including but not limited to the following applicable to this system:
    1. Local Fire and Building Department Requirements
    2. Referenced engineering standards and recommendations in this Division and Division 1
    3. The Ontario Building Code, especially for Post-Disaster restraint requirements
    4. Natural Gas and Propane Installation Code, and
    5. Canadian Gas Association regulations and written recommendations for gas systems.
    6. CAN/CSA-B149.1 Natural Gas and Propane Installation Code, latest edition.
    7. CAN/CSA-B137.4 Polyethylene Piping systems for Gas Services, latest edition.

8. Quality Control

1. Conform to requirements for quality control, standards of products, workmanship and services and to achieve tolerances as set out in Section 200500 and Division 1, including but not limited to the following applicable to this system:
  1. Provide all tests and inspections necessary to confirm the conformance of the finished system to the applicable Codes.
  2. Work to the gas distribution system shall be performed by qualified gas fitters having a minimum of three years of certified experience, certified as gas fitters at the Place of the Work.

9. Temporary Facilities, Safety, Cleaning and Waste Management

1. Conform and cooperate to ensure requirements for temporary facilities, safety, cleaning and waste management, and environment as set out in Section 200500 and Division 1 are achieved throughout the course of the Work.

10. Basic Product and Execution Requirements

1. The Trade Contractor performing the work described in this Section is specifically cautioned that work must be performed to meet the standards and requirements for supply and installation of products and materials, and related services, set out in Division 1, Section 200500, and Section 200501.

11. Commissioning Requirements

1. The Work includes all construction and related services to test, commission, and identify the gas distribution system in accordance with CSA International B149.1 Natural Gas and Propane Installation Code and local authority requirements.

12. Contract Closeout, Maintenance Manuals, & Maintenance Materials

1. Conform and cooperate to ensure requirements for contract closeout procedures, submission of manuals, and preparation of record documents as set out in Section 200500 and Division 1 are achieved.

13. Warranties

1. Provide all warranties requested in Division 1, Section 200500, and this Section. Provide warranties strictly in the format set out in Division 1.

14. Building Systems Requirements

1. In addition to the Facility Natural Gas Distribution System, the work described by this Section is related to the other Building Systems as defined in Section 019010 and discussed elsewhere in this Section. Comply with requirements for performance, review, and co-ordination of such relations as set out in that Section.

**2. PRODUCTS**

1. Devices

1. Pressure Reducing Regulating Valves

1. Spring loaded, quick response regulator with stabilizer vent, partial internal relief, by Fisher or Leslie.

## 2. Pipes and Fittings

### 1. Gas Piping shall be:

1. Type 1: black steel schedule 40 to ASTM A53 or A106 with screwed malleable iron or steel fittings up to 2" (50mm) and welded fittings over 2" (50mm).
2. Type 2: Copper piping is indicated on the drawings, and up to and including 1.25" (32mm) nominal size, use wither type G to ASTM B837, K of L to ASTM B88. All Copper connections shall be made with approved flare joints.
3. Piping for exterior buried installation shall be approved for such use by the local utility and further shall be certified to CAN/CSA B137.4 for underground use. The piping must have longest possible length in single run. No below grade joints will be allowed without specific consent of the Consultant.

### 2. Fittings

1. Units shall be Brass Craft or approved equal, CGA certified, double wall thickness, one-piece construction, corrosion and leak proof, no copper alloy in contact with gases.
2. Use eccentric reducers at all pipe size changes and install FOT to provide positive drainage.

### 3. Joints

1. Units shall be Brass Craft or approved equal, CGA certified, double wall thickness, one-piece construction, corrosion and leak proof, no copper alloy in contact with gases. Maximum length shall be 2'-0" (600mm) unless otherwise permitted by the Consultant.
2. Any joints below grade shall meet the approval of the gas Utility and shall use certified systems of joint approved by gas piping manufacturer.

## 3. Hangers and Support

1. Products and materials for hangers and support shall be as described in Section 200501 Basic Mechanical Materials and Methods. Conform to same. Keep all gas piping tight to building structure. All lateral support shall be provided, and shall connect to building structural system diaphragms and loadbearing walls only.
2. Support at Roof Surfaces to Horizontal Gas Lines
  1. Mount and fasten all gas piping running on roof as detailed and described on drawings, and further using purpose-made supports. Quick Block / E-Z Sleeper by Pipe Ease with insulation inserts and adjustable height threaded steel saddles to ensure full contact and support to piping and roof at each location.

## 4. Equipment

1. This Contract includes the connection and start up of all gas-fired equipment located in the building, and that were disconnected and reconnected to perform re-roofing operations, by the Gas Trade Contractor, without exception. Where required by sequence of construction or occupancy, or where required for commissioning of other systems, perform these operations multiple times at no additional cost.

## 5. Accessories and Appurtenances

1. Isolation valves

1. Valves sizes 0.5" (13mm) to 2" (50 mm): Lever handle brass ball valve, C.G.A. certified for natural gas services at pressures up to 0.5 PSIG (3.5 KPa). Neo model 460L or accepted equivalent.
  2. Sizes exceeding 2" (50 mm): Lever operated non-lubricated standard bore brass ball valve, chrome plated, solid ball, suitable for indoor and outdoor installations, C.G.A. certified for natural gas services at pressures up to 125 PSIG (860 KPa). Neo model 3380 or accepted equivalent.
6. External Connections
1. Each connection to a gas-fired appliance is an external connection from the system, and shall be suited to the requirements of that equipment. Do not proceed in uncertainty, and inspect all product submissions for such equipment and appliances prior to sizing piping and proposing layouts.

### 3. EXECUTION

1. Preparation
  1. Confirm all existing conditions, and layout of existing gas distribution piping.
2. Selective Demolition
  1. Provide all removals of existing gas distribution system components as may be required.
3. General Installation
  1. Installation of pipe and fittings shall conform to the Mechanical General requirements and Mechanical Basic Materials and Methods, applicable reference standards, requirements of utility and authorities, and the following additional requirements.
  2. Location of devices and lines shall be neat, in consistent relation to the building structural system rhythm and the requirements of architectural layouts. Note that gas piping to back-up or emergency generators must be independently installed for complete length of run from meter to generator.
  3. Verify fully all portions of the system as required to ensure proper operation of all new devices, equipment and new system capacity.
  4. Install piping to manufacturer's specifications and published directions. All piping shall conform to reference standards and codes.
  5. Install piping with slight downward slope in direction of gas flow for all horizontal runs, to agreed low points in system.
  6. No gas piping shall be installed in concealed walls, floor, or roof assemblies, except as penetrations to such assemblies at 90 degree angle. Co-ordinate openings to other building elements to ensure firestopping and allowance for tolerances and movement. Co-ordinate holing of structural members for pipe runs at submittals stage.
4. Installation of Devices
  1. Install valves with stems upright or horizontal.
  2. Provide valves at branch take-offs for each piece of gas-fired equipment to enable isolation and disconnection of the equipment. Provide connectors suitable for installation of equipment flex gas connecting piping supplied with the unit. Install this flex piping.

3. Install separate shut-off valves for main pipe runs to building, to adjacent building, and to back-up generator immediately following branch take-offs at the meter location.
5. Installation of Pipes and Fittings
  1. Install gas piping to meet applicable codes and regulations and particular requirements of this Contract. Conform to the most stringent requirements in each particular.
  2. Perform pipe tests to requirements of authorities, and report results in writing.
6. Installation of Hangers and Support
  1. See 200501 and conform thereto, except that hanger and support work must additionally conform to requirements stated in reference standards and codes. Conform to Post-Disaster requirements of the OBC.
  2. Provide rooftop supports to piping runs, maximum 6'-0" (1,830mm) on centre and more frequently where required by referenced codes. All piping support must be adjustable and installed to adjust the height of support without separate layers under the pipe support. Install so the device supports the piping, not the other way round.
7. Installation of Equipment
  1. Cooperate fully with Trade Contractors installing equipment to ensure that contract schedule is achieved. This includes multiple visits and mobilization for rough-ins, final connections, start up of units, and commissioning, at no further cost to Owner.
8. Installation of Accessories and Appurtenances
  1. Install valves to gas piping of sizes and locations shown, and as required for good practice to assist in isolation of equipment of other systems and for future connections at end of main lines.
9. External Connections
  1. Disconnect gas from existing gas-fired equipment of other systems to be removed or relocated in the Work or shown on drawings. Make connections to all relocated or reinstalled gas-fired equipment required in the Work, regardless of the building system to which such equipment belongs. Provide connection services and mobilize as many times as required for scheduling of start up of each piece of equipment. Not all equipment will be connected / started simultaneously or in one visit.
10. Identification and Painting
  1. The Gas Trade Contractor paints all horizontal piping across rooftops with yellow paint after preparation and application of primer, all in accordance with the standards of Section 099000. Normal trade practice of painting gas piping is not acceptable and shall result in a finding of Defective Work.
11. Testing and Commissioning
  1. Test natural gas piping systems to Gas Code requirements and log test results including all tests whether successful or revealing defects. Submit log to Consultant for review and include the log in the commissioning report for the system. Repair all leaks to the inspection authority and / or the Consultant's acceptance. All leaks shall be repaired by remaking the joint. After piping systems have been tested and repaired, repeat tests. Provide installation report certifying compliance with applicable gas codes and regulations to Consultant and to gas utility. Provide test readings of all pressures and capacities.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division One, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.
2. Comply with requirements of Section 200500 – Mechanical General Requirements, which form part of this Section as if repeated here.
3. Comply with requirements of Section 200501 – Basic Materials and Methods, which form part of this Section as if repeated here.
4. In addition to the above, particular contract requirements for the Air Distribution System are described in this Section. Contract requirements related to this system may be described in other Sections of the specification and/or drawings and schedules, as follows:
  1. Components of this system;
  2. Requirements for related systems and components of related systems that provide inputs and outputs to this system; and
  3. Requirements for systems that are indirectly affected by this system.
5. This Trade Contractor shall inspect the bid forms. Provide all items requested and required by the bidding Contractor to provide completed bid forms prior to Tender closing and in the manner set out in Section 200500, Mechanical General Requirements.

### 2. Related Requirements

1. The Contractor and this Trade Contractor are specifically cautioned that Work requires achievement of the performance objectives for this Building System described in Section 019010, Section 200500, Section 200501 and this Section. The Contractor and Mechanical Trade Contractor shall organize provision of the components of Building Systems to achieve the intent of the Building System design, and shall provide all products and execution reasonable inferable as necessary to achieve the performance objectives and intent of the design.
2. The Contractor and this Trade Contractor shall thoroughly review all Sections of the specifications and all drawings, to ensure that the contract requirement for provision of a complete and functioning Air Distribution System throughout the Work to locations where such systems are identified on drawings or in the specification is achieved.
3. The Contractor and this Trade Contractor shall:
  1. provide construction to supply Products and materials in accordance with Section 016010 and execute the installation work in accordance with Section 017010 to meet the performance requirements for anticipated service life of the assemblies;
  2. provide the design of connections and fasteners as set out in Section 017010; and
  3. provide related services as set out in the general provisions of the Contract.
4. The following components of the Air Distribution System are described elsewhere:
  1. Ductwork and Equipment Insulation, except internal linings      Section 200501
  2. HVAC Equipment      Section 237000
5. The following related systems and components of related systems provide inputs to and receive outputs from the Air Distribution System. They are described elsewhere as noted:
  1. Building Structural System receiving component loads      Section 019550
  2. Sanitary Sewage System receiving condensate output      Section 221300
  3. Electrical Distribution System providing power to components      Section 262000

6. The Air Distribution System indirectly affects the following systems described elsewhere:
    1. Emergency Egress System (emergency sequences) Section 019521
    2. Environmental Separation Systems Division 07
  7. Miscellaneous metal support of equipment and components to the Building Structural System is described in this Section, but shall be accomplished by this Trade Contractor using materials and methods as additionally specified in Division 5 for Miscellaneous Metals.
3. System Intent
    1. The Air Distribution System is an active electro-mechanical system that works together with other portions of the HVAC Systems and other Building Systems to provide appropriate, safe, and healthy environmental conditions, comfort for occupants, and to accommodate the environmental effects of processes within the building envelope and as imposed on the envelope by the exterior environment. The system accepts outdoor air and returns air to the outdoors in a balanced manner, and uses circulating air from its equipment as the medium for regulating temperature, humidity, providing ventilation, and maintaining the quality of air to spaces, their occupants, and surfaces, in accordance with changing conditions within those spaces. The system includes the means of control by which environmental conditions are sensed by the system (including detection subsystems that sense the quality of air and check for the presence of gases). The system includes the means by which instructions are provided to the components of the system to achieve the quality of environment that is the system's design intent. The work of this contract involves provision of new systems, complete.
    2. Environmental control of an enclosed and separated environment can also be regulated by passive systems, using less energy than active systems but with less quality control. The new work of this Contract involves active systems only. Windows within the building are generally not operable.
    3. The system shall operate in quiet mode, N.C. 35 maximum.
    4. Pre-packaged heating, ventilating, and air-conditioning equipment forms a part of the HVAC System, of which the Air Distribution System is a subsystem, and an exchange component with the exterior environment to reject heat from the system (such as condensing unit). HVAC equipment is further described in Section 237000.
    5. In general, the Air Distribution System includes, but is not limited to, the following components:
      1. A system of ductwork connecting to air distribution equipment, designed to provide quiet, required and continuous flow of air to and from:
        1. the spaces its serves,
        2. the outdoor environment, and
        3. equipment components of this and other systems.
      2. The ductwork shall be arranged, balanced, and dampered to ensure controlled flow of air to suit conditions in the spaces it serves.
      3. Louvres, diffusers, and grilles to effectively control and direct the air entering and leaving the ductwork circulation system without creating undue noise for occupants. Note that exterior louvres are specified in Division 08 and the Mechanical Trade Contractor shall coordinate the supply and installation of these louvres with the Contractor and trade contractors performing exterior enclosure systems work;
      4. Electrically and mechanically powered equipment such as fans, heat recovery devices, pre-packaged HVAC units, pumps, and air handling units, installed with related appurtenances to condition and circulate the air;

5. Electrically and mechanically operated sensing and control accessories that provide zoned sensing, monitoring, and instruction to operate aspects of the system and its components in accordance with the design intent and required sequence of operation. This includes appurtenances and accessories to zone, balance, maintain, drain, and supervise the system, including fittings and equipment features to allow input and output connections to and from other Building Systems and the outdoor environment. This includes a Gas Detection Subsystem that provides control for portions of the HVAC system.
  6. Supports and fittings, as described in Basic Materials and Methods, and this Section, to connect and support ductwork and equipment, and transfer loads to the Building Structural System, including vibration isolation as necessary to eliminate transfer of vibration beyond accepted criteria;
  7. Insulation to preserve the integrity of the air and equipment during circulation;
  8. Items to allow for connection of components of a energy management system or other separate supervisory system to this system, to monitor the activities of this system or to provide direct digital control of the system; (not applicable this contract except Gas Detection Subsystem and local control systems to equipment components) and
  9. Connections to other systems and components of other systems to exchange media such as air or liquids with those systems and components.
6. The routing of the Air Distribution System shall take precedence over all Building Systems except all gravity-drained Building Systems and the building structural system, where interference with proposed routing is encountered in the Work or in relation to existing conditions.
4. Existing Conditions
1. Inspect and conform to the requirements for existing conditions, this project, all as set out in Sections 002000, reference documentation, and Division 1.
  2. Inspect the drawings and site in conjunction with the requirements of the specification and provide all routing work to accommodate the work of this Contract. Note that duct transitions are not shown on drawings but are required by the Contract without additional cost. Carefully establish required cutting and the patching of partitions, ceilings, and flooring assemblies and pay all costs for this work using other trade contractors qualified in the construction of such elements. This includes but is not limited to accommodating the work of this Contract to the following:
    1. Building Structural System, with all connections and restraints required for Post-disaster in accordance with the Ontario Building Code
    2. Enclosure Systems and Partitions
    3. Ceiling assemblies and work
    4. Mechanical and Electrical Building Systems precedence as set out herein.
5. Submittals
1. Make submittals in accordance with Division 1 and Section 200500 requirements and as requested therein, and:
    1. catalogue cuts or descriptions and product literature of all Products in the Work,
    2. duct pressure testing, balancing, and testing reports,
    3. printed operation instructions and record documents as described in Division 1.
    4. The name and authorization and qualifications of the individual who shall perform the Division 1 services including Building System responsibility and commissioning. The individual shall be a journeyman tinsmith licensed to install at the Place of the Work.
    5. Copy of specific fan information for all fan components in the system, including performance curves and sound ratings.

6. Coordination

1. The Mechanical Trade Contractor shall co-ordinate the layout and installation of the Air Distribution System with other Building Systems and existing conditions in accordance with the order of precedence for systems set out in Sections 019010 and 200500.
5. Co operate with work described in other Sections to install the Air Distribution System so that it will not conflict with architectural, electrical, structural or other mechanical work.

7. Reference Standards and Codes

1. Conform to requirements for reference standards and codes set out in Section 200500 and Division 1, including but not limited to the following applicable to this system:
  1. Referenced engineering standards and recommendations in this Division and Division 1
  2. The Ontario Building Code, especially for Post-Disaster restraint requirements
  3. NFPA#252
  4. NFPA 96-17
  5. NFPA 90A-2015
  6. NFPA 90B-2015
  7. SMACNA HVAC Duct Construction Standards
  8. ASHRAE Duct Construction Recommendations – latest edition of Equipment and Practices Handbooks.
2. The Contract requires that all ducts and duct systems be provided to comply with and be constructed in accordance with all applicable codes and regulations, whether shown on drawings or not. The contract requires that ducts be pressure tested by the TVAB trade at Contractor's cost, undertaken for all sections of ductwork involving more than 6 m in the system.

8. Quality Control

1. Conform to requirements for quality control, standards of products, workmanship and services and to achieve tolerances as set out in Section 200500 and Division 1, including but not limited to the following applicable to this system:
  1. Equipment and installation shall be by an accepted Trade Contractor having at least 3 years experience in this type and size of work and having at least 2 similar projects in service at time of bidding.

9. Temporary Facilities, Safety, Cleaning, and Waste Management

1. Conform and cooperate to ensure requirements for temporary facilities, safety, cleaning and waste management, and environment as set out in Section 200500 and Division 1 are achieved throughout the course of the Work.

10. Basic Product and Execution Requirements

1. The Trade Contractor performing the work described in this Section is specifically cautioned that such work must be performed to meet the standards and requirements for supply and installation of products and materials, and related services, set out in Division 1, Section 200500, and Section 200501.

11. Commissioning

1. Start-up, commissioning, and final commissioning are defined terms within this Contract, as described in Section 018010. Provide all such work to the system. No industry practice or common understanding shall detract from the definition of these terms as set out therein, or the requirement to perform start-up, commissioning, and final commissioning as set out in Division 1, Section 200500, and this Section.

1. Perform equipment start up, system start up, and final commissioning as set out in Division 01 and in accordance with the Commissioning Plan that shall be submitted by the System Commissioner for the air distribution system. The plan must include field verification and installation checklists for all equipment and is separate from the TVAB scope of work required by this Contract.
  2. After completion and acceptance of equipment startups, systems startups, and initial balancing, operate all systems to full capacity and verify proper, safe efficient operation of all parts and each complete system. Oil motors and grease bearings before operating equipment. Cooperate fully with the TVAB trade and achieve performance requirements for the system.
  3. When work is complete and systems are in operation, adjust valves, belt drives, controls and thermostats so that there is even distribution of cooling, heating and ventilation air throughout and as shown on drawings.
  4. Upon completion of commissioning and final balancing, replace filters and leave systems in clean operating condition. Adjust all controllers, switches, and other control equipment as required to place each system in complete operating condition to Consultant's acceptance to give required performance. Cooperate with other trades and Sections during testing and balancing of each mechanical system to ensure each total system operates to acceptance.
12. Contract Closeout, Maintenance Manuals, and Record Documents
1. Conform and cooperate to ensure requirements for contract closeout procedures, submission of manuals, and preparation of record documents as set out in Section 200500 and Division 1 are achieved.
    1. Provide copies of control drawings and sequence of operations with maintenance instructions.
    2. Supply operating instruction to Building Operators for Temperature Control System and Hazardous Gas Detection Subsystem. Include description of sequence of operation, and drawings of system schematics.
    3. Turn over to Owner, necessary keys, handles and operating devices for each system.
13. Warranties
1. Provide all warranties requested in Division 1, Section 200500, and as described in this Section. Provide warranties strictly in the format set out in Division 1.
    1. By-pass boxes and motorized dampers and actuators shall have a 4 year warranty.
    2. Except where specifically noted otherwise, all warranties shall be from the date of Substantial Performance or from date of air distribution system acceptance by Consultant and Owner, whichever is later. System Acceptance shall be in the form of written letter, signed by Owner.
14. Maintenance Materials
1. Provide spare belts for all equipment. Where same set size is used for more than one piece of equipment, supply one only.
15. Related Building Systems
1. The work described by this Section is related to the other Building Systems as defined in Section 019010 and discussed elsewhere in this Section. Comply with requirements for performance, review, and co-ordination of such relations as set out in that Section.

## 2 PRODUCTS

### 1. Devices

#### 1. Grilles and Diffusers

1. Provide fully adjustable grilles and registers of sizes and types scheduled, conforming to and Certified Test Rated in accordance with Air Diffusion Council Equipment Test Code No. 1062R2 of latest date.
2. Grilles and registers shall be of steel construction (except use aluminium throughout all aluminium duct systems, see Ductwork), with clear aluminium finish, to coordinate finish with Consultant. Aluminium frames and bars shall be extruded from hard stock, free from pits and spots. Joints shall be 'hairline'. Attachment shall be with stainless steel or C.P. screws with 6.4 mm thick urethane sponge gasket set under flange.
3. Exhaust or return air registers, except where otherwise noted, shall be as scheduled, with removable key operated balancing damper.
4. Exhaust or return air grilles in lay in ceilings in sizes 12" x 12" (300mm x 300mm) and larger shall be as scheduled, and return air grilles shall be steel frame with aluminium eggcrate face plate, 5/8" (16mm) wide margin to fit 2'-0" (600mm) O.C. lay-in inverted T bar ceiling, or complete with plaster frame insert where located in boardwork ceilings. Where located in ducted system, register shall have balancing damper. Where grille size is 12" x 12" (300mm x 300mm) or larger in ceiling, provide grille as scheduled. Ceiling grilles and diffusers shall be white finish.
5. Supply air registers (except where noted) shall be as scheduled with removable key operated balancing damper unless linear system, and shall have throw and deflection noted or required to suit the area it serves.
6. Provide 4-way diffusers where scheduled, and continuous linear diffusers with false portions of length to complete the appearance of the continuous diffusers where portions of the length are not served by duct boot.
7. Provide sidewall diffusers where scheduled.
8. Provide grilles and diffusers, and wall transfer grilles where required and as scheduled.
9. Acceptable manufacturers:
  1. EH Price (basis of design)
  2. Krueger
  3. Titus.
  4. Metal\*Aire
  5. Nailor Hart

#### 2. Fixed louvres (where indicated or required by this Contract)

1. Fixed louvres in exterior walls for fan discharges or outdoor air inlets shall be Ventex as scheduled, of aluminium construction with 4" (100mm) x 12 gauge extruded storm proof blades complete with 1/2" (13mm) mesh aluminium bird-screen and extended aluminium sills and trims. Louvres shall be AMCA rated and pass required CFM at maximum 3.55 m/s @ 25 Pa SP, be degreased and prime and finished painted and have Duracon enamel finish. Each louvre frame shall be sized and positioned to suit particular depth of cladding within which it is installed. Colours shall be selected by Consultant to match colour of exterior claddings. Include all costs for selection of two colours within the overall total of required louvres.

2. Alternate acceptable manufacturers:
  1. Airolite (EH Price)
  2. Construction Specialities Ltd.
  3. Penn Ventilator Canada Ltd.
  4. Barber Coleman of Canada Ltd.
  5. Ruskin (Kerr Hunt & Assoc. Ltd.)
  6. Nailor Industries Inc.
  
2. Ductwork
  1. When ducts pass under a structural expansion joint, provide a flexible connection to allow both sides of duct to move with the two (2) parts of the structure.
  2. Standard Ductwork
    1. Ducts shall be made of first quality smooth finished, cold rolled galvanized steel guaranteed to double seam without fracturing of thickness noted. Ducts exhausting washroom, shower, and change room / decontamination room, or Janitor Room shall be aluminium wherever new. Ducts for outdoor air intakes shall be aluminium.
    2. Round ducts exposed to view shall be Alpha Industries Ltd., Mississauga or equal "Multi Rib" 26 gauge satin coat galvanized steel spiral lock seam duct with "ASM" preformed fittings.
    3. Sound-line all furnace, fan unit, ERV and HVAC unit supply and return air ducts for minimum 3 metre distance from units. Sound-line all transfer ducts for complete length and include minimum two 90 degree bends in such ductwork.
    4. All transfer ductwork shall be sound lined, for complete length and without exception.
  3. Flexible Ductwork
    1. Flexible duct shall be pre-insulated Trans Continental Equipment Ltd. type 'SI' Al U Flex aluminium or Thermoflex M.KC glass fibre flexible air duct hoses each U.L.C. listed. Hoses must be aluminium on all aluminium duct systems.
    2. Flexible air duct hoses shall be secured to metal ducts with attachment screws and band clamps and tape seal with Permascreen fiberglass duct tape.
  4. Plenums
    1. Plenum section shall be provided and properly sized for inlet and/or discharge air flow (between 60 and 1500 feet per minutes). The plenum shall provide a single or multiple openings as shown on drawings and project schedule. Provide sound lining to plenums unless noted otherwise.
  5. Open End Transfer Ducts
    1. Shall be as detailed and scheduled, and in addition all transfer ducts shall be acoustically lined to their full length, complete with minimum 2 90 degree bends. There shall be no line of sight between transfer duct ends.
  
3. Hangers and Supports
  1. Conform to Section 200501 Basic Materials and Methods for supports and hangers.
  2. Support for duct assemblies and components from building structure shall be 1" (25mm) x 3.3mm thick galvanized steel 'Z' band hanger secured under ducts. Unistrut and threaded rod shall be used for ducts over 850 mm wide.

4. Equipment

1. HVAC Equipment shall be additionally as specified in Section 237000.

5. Accessories and Appurtenances

1. Duct liner shall be rigid coated duct liner of 4 – ½” density with flame spread rating of 25, fuel contributed rating of 15 and smoke developed rating of 40 with Neoprene face coating.
2. Duct sealant shall be Multi Purpose Air Duct sealant, U.L.C. labelled, as provided by Trans Continental Equipment, Concord or Flexmaster Duct Bond II (Richmond Hill).
3. Pitot tube opening enclosures shall be Dial #1000 or 2000 (Air Power Equipment, Toronto).
4. Air turning assembly shall be double thickness type with Duro Dyne #VR 2 vane rails.
5. Duct tape shall be Duro Dyne GS, 50 mm wide self-adhesive duct tape and joint tape seal to acceptance with Arno #C 520.
6. Flexible connections shall be 24 oz (813.7 g/m<sup>2</sup>) Durolon coated glass fabric.
7. Provide Sound and thermal insulation where noted on drawings or in this specification. Not all insulation is shown on drawings.
8. All filters except OEM filters supplied with HVAC equipment shall be as scheduled in Section 237000 and shall be by National General or accepted alternative.

9. Access Doors in Ductwork

1. Provide access doors of suitable size (min. 300 mm x 400 mm) for access to installed equipment in ducts and where necessary for access to balancing and fire dampers, or other accessories or external connection components. Make doors of 0.8 mm galvanized steel hinged to 0.8 mm galvanized mounting frame with approved quick opening fastening devices to give tight closure on fire resistant gasket. Provide access in ceilings where necessary for splitter and balancing dampers. Provide Duro Dyne #SRC concealed operators for each splitter or balancing damper above fixed ceiling complete with extension rod, coupling and dial operators.
2. Access doors shall be assembled with Duro Dyne SP 21 latch assembly, HP series piano hinges and GN neoprene closed cell gasket material.

10. Space Sensors

1. Shall be supplied and installed by the Mechanical Trade Contractor in accordance with the drawings and schedules, and as required to fully control the HVAC system, all as part of this Contract. Where existing sensors are to be relocated, commission units to complete range of functions and sequences. Mechanical Trade Contractor must co-ordinate sensors and equipment to ensure compatibility.

11. Dampers

1. Nothing in this Contract shall relieve the Mechanical Trade Contractor from ensuring that all dampers are provided. Where dampers are not scheduled for connection and control by any other system, future system, provide dampers in accordance with this Section and as shown on drawings.
2. Volume Balancing Damper
  1. Volume balancing dampers as required to meet quality provisions of this Division. Tamco, Controlled Air and Alumavent are acceptable manufacturers.

3. Fire Dampers and Fire Stop Flaps
  1. Provide ULC-approved dynamic fire dampers and fire stop flaps at all locations where ductwork passes through fire-resistive rated assemblies, whether horizontal or vertical, regardless of whether such devices are shown on drawings or not. Inspect complete drawings of this Contract to ensure all fire resistive assemblies are understood.
  2. E.H. Price, Nailor, Ruskin, Controlled Air, Alumavent, dynamic type, out-of-airstream type acceptable.
  3. All fire dampers shall be tested by the TVAB trade after installation and a report submitted that certifies operation.
4. Motorized Dampers
  1. Motorized dampers shall be E.H. Price, suitable for control. Bellimo, Nailor, Controlled Air and Ruskin are acceptable alternative manufacturers.
  2. New motorized dampers shall be provided with 120V actuators, as scheduled and complete with remote thermostat and /or sensors. All work to sensors and control is by Mechanical Trade Contractor. Electrical Trade Contractor wires line voltage power feed wiring only.

### 3. EXECUTION

1. Preparation
  1. Prior to site mobilization, perform all general work and services required by Part 1 and Sections 200500 and 200501 to ensure acceptance of design, products, and proposed execution.
  2. Prior to installation, on site, lay out ALL exposed components of system and device locations for Consultant's acceptance, and also concealed lines and ducts wherever conflict can occur. Revise routing and locations as directed by Consultant.
2. General Installation
  1. Installation of ducts, equipment, motors and devices shall conform to the Mechanical General requirements and Mechanical Basic Materials and Methods, and the additional requirements set out in this Section.
  2. Location of devices and lines of system shall be neat, in consistent relation to the building structural system rhythm and the requirements of architectural layouts. In general, all wiring in conduit and all exposed duct routing shall run parallel to and at right angles to walls and structure.
  3. Offsets for ductwork are not shown on drawings. Provide ductwork tight to underside of exposed ceilings and tight to underside of structure in concealed ceilings. Include all work and include all costs to install ductwork to highest possible ceiling height and to offset under structural beam elements.
  4. All installation work must conform with Post-Disaster requirements of the Ontario Building Code. This includes restraint for all ductwork, equipment, and elements in suspended ceilings. Provide all work and include all costs to conform with requirements, including design of restraints.
3. Installation of Devices

1. Install louvres, grilles, registers and diffusers to manufacturer's direction and in strict accordance with architectural layout. Provide baffles in diffusers to suit air pattern. Adjust grilles and registers to give required air throw and pattern.
  2. Connect ducts to louvres so that maximum free area of louver is used and any moisture in ducts will drain out through louver. Co-ordinate installation with the wall enclosure trade contractor installing the louvre or provide drain at bottom duct and drain to F.F.D. or exterior. Provide all work to assist in the sequencing of the louvre installation to achieve the performance requirements of the barrier systems in the Environmental Separation System.
4. Installation of Ductwork
1. Provide ducts and sheet metal shown and required to complete duct systems and put each in operating condition. Air Distribution Trade Contractor is responsible for laying out this work. Drawings showing ducts must not be used for obtaining dimensions for layout except where dimensioned. Mechanical Drawings indicate general location and route of ductwork to be installed and do not indicate all offsets, bends, or drops required by the Contract and this Specification Section. Provide all such work at no further cost to the Contract. General layout of ducts may be taken from Drawings but this Trade Contractor is responsible for avoiding interferences with other work described in other Sections not specifically shown on Mechanical Drawings, in accordance with the order of precedence of the systems. Actual measurements shall be taken at location of installation before ductwork is fabricated.
  2. Make without additional charge, any necessary changes or additions to layout of ductwork to accommodate structural, duct, piping, ceilings, electrical or equipment conditions. Where openings in walls for ductwork have been provided by other trades, make full use of such openings by fabricating ductwork to fit them or if necessary, provide offsets and transitions to suit. Location of ducts may be altered if change is made before installation, is submitted in writing, is accepted by Consultant and does not cause Owner or other trades any extra expense.
  3. Duct Fabrication:
    1. Construct ductwork (unless otherwise noted) of galvanized or first quality smooth finished, cold rolled galvanized steel guaranteed to double seam without fracturing, and of equivalent strength thicknesses of aluminium for all locations so required by this Section, of following thickness:
- | Longest Side    | Steel<br>mm | USG | Colour<br>Code |
|-----------------|-------------|-----|----------------|
| Up to 300 mm    | 0.5         | 26  | Blue           |
| 325 to 750 mm   | 0.6         | 24  | Orange         |
| 775 to 1375 mm  | 0.8         | 22  | Green          |
| 1405 to 2150 mm | 1.0         | 20  | Yellow         |
| 2175 mm & Over  | 1.3         | 18  | White          |
4. Make ductwork exposed to weather of soldered construction, shop prime painted and finished in two coats of paint as described in Section 099000.
  5. Form ducts with thickness (gauge) markings or colour coding on exterior of ductwork visible from floor.
  6. Make joints suitably air tight with laps in direction of air flow. Wherever possible, sizes of ducts shall conform to those indicated. Where building conditions require shape be modified, ducts must have same cross sectional area indicated and width of duct shall not exceed six times depth except with special approval. Ductwork shall be in accordance with ASHRAE Guide of latest publication. Duct leakage shall not exceed 3% of air volume at 500 Pa S.P.
  7. Construct ducts up to 2'-0" (600mm) with reinforced ribs formed by pocket slip spaced not more than 4'-0" (1220mm) apart. Make ducts 2'-0" (600mm) and over in either dimension with reinforcing rib formed by pocket slip spaced not more than 4'-0" (1220mm) apart.

Provide supplemental stiffening, etc. to prevent drumming and make a structurally sound assembly. Cross break all duct faces except those to which rigid board type insulation is to be applied.

8. Make downstream end of each section of concealed round ducts small and beaded. Assembly by inserting small end into upstream end of adjoining section. Fasten joints in place by sheet metal screws spaced not over 3" (75mm) apart.
9. Assemble various duct sections with Snap Lock or Pittsburgh lock and grooved longitudinal seams carefully closed for tightness and appearance. Join duct sections with pocket slip sized to conform to following requirements:

Maximum Side Duct	Duct mm USG	Slip mm USG	Slip Size	Slip Reinforced
Up to 300 mm	0.5 26	0.5 26	25 mm	No
328 to 750 mm	0.6 24	0.6 24	25 mm	No
775 to 1375 mm	0.8 22	0.8 22	25 mm	4 x 35 mm
1400 to 2150 mm	1.0 20	1.0 20	25 mm	4 x 35 mm
2175 mm & Over	1.2 18	1.2 18	25 mm	4 x 35 mm

10. Support ducts over 3'-0" (915mm) size with ¼" (6mm) steel rods and 32 x 32 x 6 mm angle iron up to 1800 mm and 50 x 38 x 9 mm angles and 9 mm rods for larger sizes. Space hangers at not over 1800 mm centers. See 200500 20 and 21.
11. Make radius of turns at least one duct width. Where space prevents such radius, make turns square and fit with turning vanes of double faced hollow type with Duro Dyne vane rails secured with sheet metal screws.
12. Provide splitter damper in each supply take off. Provide manual balancing damper in each return or exhaust takeoff set as close as possible to trunk duct. Make turning vanes, dampers, deflectors, splitters of same material and thickness as for equal size ductwork with formed edges, cross broken and stiffened. Fit balancing dampers with lockable quadrant operator. Fit splitter dampers with rod operators spaced at maximum 600 mm centres. Splitters shall be full depth of branch duct and 1 1/2 times branch width.
13. Seal all duct joints during construction with Air Duct sealant. Apply to faces of joints before cleats are installed where space is restricted and after cleats are installed where access is available.
14. Provide extension collars for outlets, air guide vanes and other special features as indicated or required including connections to equipment provided by Owner or described in other Sections. Transition ducts at not more than 30 degree slope to full size of each grille, register, louver, coil or equipment.
15. This trade contractor shall paint inside of duct connections behind each grille and register with two coats of black non-reflective paint to visually conceal duct interior to acceptance.
16. At floor line and at other points where ducts join louvres, concrete or masonry construction or where ducts pass through floors, rivet ducts on approximately 6" (150mm) centres to 38 x 38 x 1800 mm galvanized steel angles secured with expansion shields and bolts on approximately 12" (300mm) centres and caulk air and water tight. At louvres, drill blades for drainage.
17. Install ductwork to clear structural members and any fire proofing. Locate ducts to permit their proper insulation where required. Do not remove or damage structural fireproofing. Leave space to permit insulation and fireproofing to be inspected and repaired.
18. Seal all ducts entering ceiling plenums air and noise tight with fibreglass packed snug around all four sides and sealed with approved incombustible caulking/sealing compound to approval. If openings are larger than 1" (25mm), cement grout opening and then seal to approval. Report all other openings left unsealed in writing.

19. Soundline packaged HVAC unit and furnace supply & return air ducts and all energy recovery ventilator supply air ducts 3m from units. Soundline 6m of ERV ventilator return air duct.
20. Provide flexible connections between equipment and ductwork and where shown. Provide suitable sheet metal rain guard for exterior fabric connections secured to fan only.
21. Provide where shown, flexible air duct hoses. Secure hose to metal ducts with attachment screws and band clamps and tape seal. Maximum length 2 m. Provide manual balancing damper in trunk duct at connection to each flexible duct.
22. Provide pitot tube opening enclosures with cap and chain in ductwork for each supply, return and exhaust system. Provide openings at all supply fan discharges, at return fan inlets and exhaust fan inlets, before and after silencers and heating coils in ductwork, and at main branch duct take offs. Locate openings in straight duct runs. Provide a minimum of three holes per duct at each of above locations, and at not more than 450 mm centres.

#### 6. Hangers and Supports

1. See 200501 and conform thereto, except that hanger and support work must additionally conform to requirements stated in reference standards and codes for Post-Disaster Buildings.
2. Support ducting and other components independently of equipment to permit disconnection and removal without disruption of ducting system. Locate flanges, connection and dampers to permit easy removal of connections and equipment with minimum removal of remainder of system.
3. Install each suspended unit in place with steel rods from building structure using inserts provided in place by this Section. Installation shall comply with equipment manufacturer's written directions and be accepted by Consultant. Supply spring type anti vibration mount at each support point. Hangers and isolators shall not extend below bottom of unit when ceiling mounted.

#### 7. Equipment

1. Start-up of units, checking of controls, setting of switches, balancing of drives, and balancing of all air flow shall be performed by service personnel who are trained in servicing this equipment and whose only function is service work.
2. Install all equipment to isolate vibration and noise, and in strict accordance with the manufacturer's written instructions for the specific condition of installation and service life. Installation shall be subject to mockup, undertaken in conjunction with the lay-in ceiling and boardwork trade contractor, to co-ordinate location of all components of each system for best orientation of unit for service and maintenance, without interference from components of either system. Demonstrate the service to the satisfaction of Consultant and do not proceed further with installations until the mockup is accepted.
3. Perform two (2) subsequent service calls at 3 months and 6 months to check operation of units and switches, and to check all filters. Pay all costs for these visits and for replacement of filters if so required.
4. Electrical Trade Contractor shall ensure power to each piece of equipment at equipment or starter location. Control wiring work shall be performed by mechanical trade contractor except when explicitly stated as by electrical trade contractor in each instance. Electrical trade contractor shall perform any controls work that is "in line" with the power feed to the equipment under the direct supervision of the person responsible for the HVAC System and for compliance with Division 1 requirements for the system. No exceptions.
5. Install equipment as described in Section 237000 requirements.

8. Accessories and Appurtenances

1. Dampers

1. Volume Balancing Dampers

1. After final adjustments are made for air handling systems by the TVAB trade contractor, lock each control device in position and visually indicate required setting with permanent marking. For splitter and balancing dampers, provide additional locking screw or bolt to acceptance of Consultant.

2. Fire Dampers and Fire Stop Flaps

1. Provide Fire Dampers and Fire Stop Flaps where shown or required by Ontario Building Code, local Fire Ordinances and Provincial Fire Marshal.
2. Secure each Fire Damper in place in steel sleeve fitted with steel angle frame secured to sleeve to approval. Clean and prime paint all metal parts. Provide clearances to perimeter of dampers from adjacent construction in accordance with manufacturer's written instructions and detailing.
3. Fire Stop Flaps shall be installed to manufacturer's printed instructions including ceramic fabric over diffuser or register to complete fire rating to ULC approval.
4. Fire Dampers in gypsum wallboard or at ceilings (not F.S.F.) shall be secured in place independent of ductwork complete with steel channels and wire to manufacturers printed directions.

2. Sensors

1. Co-ordinate and install thermostats, control panels, and sensors at heights and in locations for conformance with Codes, including handicap accessibility requirements for user operated thermostats and controls.
2. Install control thermostats, control panels, and sensors in strict accordance with manufacturer's written instructions for the specific condition of installation and service life. Wire all such control items direct from units and as set out in schematics and in strict accordance with manufacturer's written instructions for best achievement of performance and design intent. No exception shall be tolerated.

9. Sequences of Operations

1. Control shall be locally operated except where otherwise noted. Systems shall be installed by competent control mechanics and electricians employed by the air distribution trade. See Sequence of Operations on drawings and as follows:

2. Electrical Wiring

1. All electrical wiring required for controls (except where otherwise noted) shall be supplied and installed by this Contract, in conduit wherever exposed in the finished Work. In general, electric control connections and wiring necessary to provide control of components of a Building System, to ensure its complete and integrated function, and to ensure it fulfils each and every requirement of the system sequences of operation and the functions of the component, shall be provided by the Trade Contractor responsible for such system. Conduit for such wiring shall be provided by the Electrical Trade Contractor for all devices of systems that are shown on electrical drawings, whether electrical or for other systems. All other conduit for controls wiring for devices not shown on electrical, and for equipment and appurtenances, shall be provided by the trade contractor responsible for the system. All control wiring installed shall be run in EMT conduit and shall otherwise conform with requirements of Division 26. Electrical trade contractor provides installation

work only where explicitly noted in the electrical drawings and schedules. Otherwise all such work is by the Mechanical Trade Contractor.

2. Co ordinate location of power outlets for controls with Electrical Trade Contractor. Provide on/off switch on each circuit for service.

#### 10. External Connections

1. Install external connection points to other systems as required for the proper function of this system and as required by Code.
2. Cooperate with forces installing connections from other systems to integrate the operation of the devices, units, and equipment and to achieve the HVAC performance intent.

#### 11. Testing and Commissioning

1. Operate all systems to full capacity and verify proper, safe efficient operation of all parts and each complete system in all its sequences of operation and expected conditions. Oil motors and grease bearings, and bump motors to ensure proper wiring before performing other aspects of equipment startup. Testing and certification of the air monitoring system is included in the work of commissioning.
2. Turn over to Owner, necessary keys, handles and operating devices for each system.
3. When work is complete and systems are in operation, adjust valves, drives, controls, valves, dampers and thermostats so that there is even distribution of cooling, heating and air and water throughout.
4. Mechanical Trade Contractor shall employ and cooperate with Balance/Test Company and supply sufficient manpower, tools, scaffolds, ladders, etc., to enable each system to be suitably verified and finally adjusted to give required performance. Rough balance all air systems to obtain flows specified. Provide test/balance reports on all items. See Section 200850.
5. Provide and locate all necessary access doors, system sensors, dampers, volume balancing dampers, and configurations of ductwork and branches shown or specified in proper locations to direction of Balance/Test Company. Note that tradesmen must be supplied to properly assist work of balancing company, including assistance with clean hands or toss away protective gloves required to remove ceiling tiles, guards or access doors, or similar for testing and placing them back in a clean condition when balancing work is finished.
6. It is responsibility of each trade contractor installing a system to adjust equipment, valves, splitters, dampers, controls, drives and speeds necessary to put each system into its proper design operating condition prior to performance of verification and final adjustment by the TABV trade contractor. Each system upon final verification shall be within 3% of design figures.

#### 12. Instruction to Operator

1. Instruct Owner's Building Operator in care, maintenance and operation of the Air Distribution System and its components and relation to other systems. See 200500 and 200501 for further detail.
2. Provide all Division 1 services for submission of manuals, spare parts, and specialized tools for the system.
3. Cooperate with the TABV Trade Contractor to record and mark all final settings of manual dampers.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division One, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.
2. Comply with requirements of Section 200500 – Mechanical General Requirements, which form part of this Section as if repeated here.
3. Comply with requirements of Section 200501 – Basic Materials and Methods, which form part of this Section as if repeated here.
4. In addition to the above, particular contract requirements for the supply of portions of HVAC equipment for this Supply Contract are described in this Section. Contract requirements and construction related to this equipment may be additionally described in other Sections of the specification and/or drawings and schedules, as follows:
  1. Other components of building systems to which this equipment relates;
  2. Requirements for related systems and components of related systems that provide inputs and outputs to this equipment and to the systems of which it forms part; and
  3. Requirements for other building systems that are indirectly affected by this equipment and the systems of which it forms part.
5. This Supplier shall inspect the bid forms. Provide all items requested and required to provide completed bid forms prior to Tender closing and in the manner set out in the Instructions to Bidders, Division 1, and Section 200500, Mechanical General Requirements.

### 2. Related Requirements

1. The Contractor and this Trade Contractor are specifically cautioned that Work requires achievement of the performance objectives for this building system described in Section 019010, Section 200500, Section 200501 and this Section. The Contractor and Mechanical Trade Contractor shall organize provision of the components of building systems to achieve the intent of the building system design, and shall provide all products and execution reasonable inferable as necessary to achieve the performance objectives and intent of the design.
2. The Contractor and this Trade Contractor shall thoroughly review all Sections of the specifications and all drawings, to ensure that the contract requirement for provision of a complete and functioning HVAC System and related subsystems throughout the Work to locations where such systems are identified on drawings or in the specification is achieved.
3. The Contractor and this Trade Contractor shall:
  1. provide construction to supply Products and materials in accordance with Section 016010 and execute the installation work in accordance with Section 017010 to meet the performance requirements for anticipated service life of the assemblies;
  2. provide the design of connections and fasteners as set out in Section 017010; and
  3. provide related services as set out in the general provisions of the Contract.
4. The HVAC systems are further described elsewhere:
  1. Testing and Balancing, Verification Section 200850
  2. Air Distribution System subsystem of the HVAC Systems Section 233000
  3. Ductwork and Equipment Insulation, except internal linings Section 233000
  4. Louvres, Backdraft dampers, motorized dampers Section 233000

5. The following related systems and components of related systems provide inputs to and receive outputs from the Building Systems of which the equipment described by this Section forms part (the "External Connections"). Within the contract documents for the main Contract of which this Supply Contract will form part, they will be described therein:
  1. Building Structural System receiving component loads Section 019550
  2. Gas Distribution System, for inputs to the RTU's Section 231120
  3. Electrical Distribution System for power input to components Section 262000
7. The equipment and/or components described by this Section indirectly affect the following building systems. Within the contract documents for the main Contract of which this Supply Contract will form part, they will be described therein:
  1. Environmental Separation Systems Section 070500
  2. Fire Separation System Section 019522
3. System Intent
  1. Ensure that existing Packaged HVAC equipment that are disconnected and reconnected as a result of re-roofing operations, function as intended.
  2. Provide new HVAC equipment where Scheduled, as supplemental and stand-alone cooling systems to select areas within the building.
  3. The HVAC equipment shall be supplied in strict co-ordination with the HVAC systems to enable the Contract of which it forms part to provide one integrated and balanced Indoor Environmental Control System for the building.
4. Existing Conditions
  1. Inspect and conform to the requirements for existing conditions, this project, and existing building as set out in Sections 002000, reference documentation, and Division 1.
5. Submittals
  1. Conform to the submission requirements of Division 1, and Section 200500 and Submit:
    1. Shop Drawings: Indicate assembly, unit dimensions, weight loading, required clearances, construction details, protection and handling requirements, lifting and field connection details, and electrical characteristics.
    2. Provide manufacturer's installation instructions.
    3. Maintenance Data: Include instructions for lubrication, filter replacement, motor and drive replacement, spare parts lists, piping diagrams, and instructions for maintenance of any other component of the equipment.
6. Coordination
  1. The Mechanical Trade Contractor shall co-ordinate the layout and installation of the Packaged HVAC System with other building systems and existing conditions in accordance with the order of precedence for systems set out in Sections 019010 and 200500.
  2. Co operate with work described in other Sections to manufacture and supply the equipment so that it may be installed without conflict with existing conditions, architectural, electrical, structural or other mechanical work of the Project.
7. Reference Standards and Codes
  1. Conform to reference standards and codes in Sections 200500, this Section, and Division 1.

8. Quality Control
  1. Conform to requirements for quality control, standards of products, workmanship and services and to achieve tolerances as set out in Section 200500 and Division 1, including but not limited to the following applicable to this system:
    1. Equipment and installation shall be by an accepted Trade Contractor having at least 3 years experience in this type and size of work and having at least 2 similar projects in service at time of bidding who is acceptable to the Owner.
9. Temporary Facilities, Safety, Cleaning, and Waste Management
  1. Conform and cooperate to ensure requirements for temporary facilities, safety, cleaning and waste management, and environment as set out in Section 200500 and Division 1 are achieved throughout the course of the Work, including at sites of fabrication and during delivery operations.
10. Basic Product and Execution Requirements
  1. The Supplier performing the work described in this Section is specifically cautioned that such work must be performed to meet the standards and requirements for supply of products and materials, and related services, set out in Division 1, Section 200500, and Section 200501.
11. Commissioning
  1. Start-up, commissioning, and final commissioning are defined terms within this Contract, as described in Section 018010. Provide all such work to the system. No industry practice or common understanding shall detract from the definition of these terms as set out therein, or the requirement to perform start-up, commissioning, and final commissioning as set out in Division 1, Section 200500, and this Section.
    1. Operate all units to full capacity and verify proper operation of all parts and each complete system as part of system re-commissioning, prior to verification and final testing and balancing.
    2. Each packaged HVAC equipment subsystem shall be balanced both separately and in conjunction with the other subsystems, and air quantities per unit.
    3. Test and balance each air system in accordance with Section 200850.
    4. Upon completion of commissioning, replace filters and leave units in clean operating condition. Adjust all controllers, switches, and other control equipment as required to place each system in complete operating condition to Consultant's acceptance to give required performance.
12. Contract Closeout, Maintenance Manuals, and Record Documents
  1. Conform and cooperate to ensure requirements for contract closeout procedures, submission of manuals, and preparation of record documents as set out in Section 200500 and Division 1 are achieved.
    1. Turn over to Owner all necessary keys, handles and operating devices for each piece of equipment.
    2. Maintenance Data: Include instructions for lubrication, filter replacement, motor and drive replacement, and spare parts lists.

13. Warranties

1. Provide all warranties requested in Division 1, Section 200500, and as described in this Section. Provide warranties strictly in the format set out in Division 1.
  1. Compressor units shall have extended 5 (five) year Parts and Labour Warranty. This warranty shall include compressor, refrigerant tubing, air coil, and heat exchanger.
  2. Except where specifically noted otherwise, all warranties shall be from the date of substantial performance or from date of HVAC Systems acceptance by Consultant and Owner, whichever is later.

14. Building Systems

1. The work described by this Section is related to the other Building Systems as defined in Section 019010 and discussed elsewhere in this Section. Comply with requirements for performance, review, and co-ordination of such relations as set out in that Section.

**2. PRODUCTS**

1. Packaged Rooftop Units – Existing to Remain u.n.o.
2. Energy Recovery Ventilators (ERV) – N/A this Project
3. Exhaust Fans (EF)
  1. Standard of Acceptance: PennBarry, models as specified, complete with factory-mounted disconnect. Alternatives by Greenheck, ACME, Loren Cook, and meeting all performance and accessories requirements.
  2. Exhaust Fans
    1. Performance Ratings: Conform to AMCA 210 and bearing the AMCA Certified Rating Seal.
    2. Sound Ratings: AMCA 301, tested to AMCA 300, and bearing AMCA Certified Sound Rating Seal.
    3. Fabrication: Conform to AMCA 99.
    4. Performance: as scheduled on drawings.
    5. Cabinet Fan-Ceiling Mounted
      1. Centrifugal direct drive, suitable for ceiling installation, zinc coated rectangular acoustically lined metal housing and backdraft damper.
      2. Blower resiliently mounted, polymeric or metal and balanced.
      3. Motor plug-in type, permanently lubricated and thermally protected.
      4. Integral steel grille.
    6. Cabinet In-Line
      1. Centrifugal belt drive, zinc coated metal housing, acoustically lined, inlet and outlet connecting flanges and side access panels.
      2. Forward curved blower and balanced.
      3. Fan motors continuous duty, ball bearing design, permanently lubricated, positively cooled and thermally protected.
5. Furnace(s) – Existing to Remain
6. Air Conditioning Condensing Unit (CU1)
  1. Standard of Acceptance: Carrier, model as specified. Alternatives: Lennox, Trane, York, and meeting all performance and accessories requirements.
  2. Air Condensing Unit

1. Unit shall be UL labelled and construction shall comply with ANSI/ASHRAE standard, CSA approved, 16 SEER.
  2. Outdoor pad-mounted, factory assembled, with a hermetic compressor, air cooled coil, propeller type condenser fan and control box, propeller type blow through outdoor fans, reversing valve, accumulator, holding refrigerant charge, heating mode metering device, piping factory wiring and control box. Unit shall discharge air vertically. Unit shall function as the outdoor component of an air-to-air cooling system.
  3. Unit cabinet constructed of galvanized steel and coated with a powder coat paint.
  4. Outdoor fans shall be direct-drive propeller type, and shall discharge air vertically upwards through the outdoor coil. Outdoor fan motors shall be totally-enclosed with permanently-lubricated sleeve bearings. Motor shall be protected by internal thermal overload protection. Shaft shall be corrosion resistance. Fan blades shall be corrosion resistance and shall be statically and dynamically balanced. Fan openings shall be equipped with PVC coated steel wire safety guards.
  5. Compressor shall be hermetic sealed and mounted on rubber vibration isolators.
  6. Condenser coil shall be constructed of aluminium fins mechanically bonded to seamless copper tubes which are cleaned, dehydrated, and sealed.
  7. Refrigeration circuit components shall include shutoff valves and charged with R-410A refrigerant.
  8. Supply unit with NEMA rated electrical disconnect for mounting adjacent unit.
7. Split A/C Systems
1. As Scheduled on drawings.
8. Accessories and Appurtenances
1. In accordance with Section 200501 and as further described with each piece of equipment.
  2. Refrigerant Piping Line Sets (for CU-1 connection)
    1. Suction and liquid line piping shall each be single length of copper, approved by equipment manufacturer for use with the cooling subsystem between furnace coil and outdoor condensing unit, sized for length and diameter to suit capacity of system. Piping shall be complete with UV-resistant insulation jacket and protective end caps.

### 3. EXECUTION

1. Preparation
  1. Prior to site mobilization, perform all general work and services required by Part 1 and Sections 200500 and 200501 to ensure acceptance of design, products, and proposed execution.
2. General Installation
  1. Installation of components shall conform to the Mechanical General requirements and Mechanical Basic Materials and Methods, and the following additional requirements.
  2. Location of devices and lines of system shall be neat, in consistent relation to the building structural system rhythm and the requirements of architectural layouts.
  3. Make all duct connections through flexible duct connectors.
  4. Level units while fans are in operation and align ductwork providing clearance in proportion to flexible duct connector length, ensuring that misalignment of ductwork when fan is not in operation does not strain or damage the connector.
  5. Power wiring under Division 26. All control wiring shall be factory installed except remote thermostat low voltage units. Conduit for thermostats mounted in areas of exposed wiring

routes shall be in conduit provided by Electrical Trade Contractor. Mechanical Trade Contractor provides co-ordination of locations and provides all wiring and control connections.

7. Make all piping connections to heating coils, cooling coils and humidifiers from appropriate service systems.

### 3. Equipment Installation

#### 1. General

1. Start-up of units, checking of controls, setting of switches, balancing of drives, and balancing of all air flow shall be performed by service personnel who are trained in servicing this equipment and whose only function is service work.
2. Isolate vibration and noise, and in strict accordance with the manufacturer's written instructions for the specific condition of installation and service life.
3. Electrical Trade Contractor shall provide power wiring to each piece of equipment at equipment or starter location. All further wiring is by Mechanical Trade Contractor.

#### 2. Exhaust Fans

1. Install fans where indicated, to manufacturer's instructions and complete with accessories.
2. Ensure fan is installed resiliently on roof curb or isolated from structure where suspended.

#### 3. Furnace – Existing to Remain

#### 4. Condensing Units

1. Install in accordance with manufacturers recommendations.
2. Install level on mounting pad with vibration isolators. Install external p-trap with drain-off for condensate drain as provided by manufacturer.
3. Install refrigeration piping between the condensing unit and the cooling coil indoor unit. Shall be sized as per manufacturer's recommendation. Suction line shall be insulated with a flexible elastomeric thermal pipe insulation, ½" thickness with a maximum flame spread rating of 25 and smoke developed rating of 50.
4. Condensate drain to nearest hub drain.

#### 6. Cooling Coil

1. Install in accordance with manufacturers recommendations.
2. Install on furnace and ensure connections are airtight.
3. Install refrigeration piping between the the cooling coil and air condensing unit. Shall be sized as per manufacturer's recommendation. Suction line shall be insulated with a flexible elastomeric thermal pipe insulation, ½" thickness with a maximum flame spread rating of 25 and smoke developed rating of 50.
4. Install external p-trap with drain-off for condensate drain and terminate above hub drain.

#### 7. Energy Recovery Ventilator

1. Install in accordance with manufacturer's instructions.
2. Shall be mated to respective packaged rooftop HVAC unit as indicated on drawings and

equipment schedule. Use transition ducts to mate to the HVAC unit.

3. Install 4" thick batt insulation under energy recovery unit on roof deck.
  4. Manufacturer's representative to provide start-up service, commissioning and operating and maintenance instructions.
  5. Provide written report of test results to Consultant and perform all commissioning as set out in this Section and Divisions 20 and 1.
8. Packaged Rooftop HVAC Units
1. Install level on existing roof curb.
  2. Install external p-trap with drain-off for condensate drain as provided by manufacturer.
  3. Provide 4" thick batt insulation under HVAC unit on roof deck.
  4. Pack space between ducts and at roof penetration with insulation, seal all joints and voids.
  5. Provide start-up service, commissioning and operating and maintenance instructions. Provide written report of test results to Consultant and perform all commissioning as set out in this Section and Divisions 20 and 1.
4. Accessories and Appurtenances
1. Install in locations shown on plans. Coordinate location with Consultant and Owner.
  2. Refrigerant Line Sets
    1. Co-ordinate holing to building enclosure and routing of the line set before confirming order. Do not install line sets until exterior enclosure work and all work in the area of the piping that may result in damage to the line sets is complete and accepted.
    2. Install line sets in a single run, ensuring that the finished installation has no kinks or imperfections.
    3. Charge line sets and commission the cooling loop only after other components of the HVAC systems are operational and controls are installed.
    4. Protect line sets from damage until handover of the completed Work.
5. Sequences of Operations
1. General
    1. Control shall be locally operated except where otherwise noted. Systems shall be installed by competent control mechanics and electricians employed by the Mechanical Trade Contractor.
  2. Electrical Wiring
    1. All electrical wiring required for controls (except where otherwise noted) shall be supplied and installed by this Contract and the Mechanical Trade Contractor. All control wiring installed shall be run in EMT conduit and shall otherwise conform with requirements of Division 26. Where control devices are shown on electrical drawings the Electrical Trade Contractor shall provide empty conduit and boxes as required for the control wiring and devices. Otherwise, Mechanical Trade Contractor provides all conduit and boxes to suit the layout of devices and equipment, at no further cost to the Contract.
    2. Co ordinate location of power outlets for controls with Electrical Trade Contractor. Provide on/off switch on each circuit for service where disconnects are not supplied with the equipment.

6. External Connections
  1. Install external connection points to other systems as required for the proper function of systems and as required by Code.
7. Testing and Commissioning
  1. Field Testing of Units
    1. Do all field tests in the presence of the System Commissioner as set out in Division 01 and record all tests on forms acceptable to the Consultant. Issue the test report in triplicate to the Consultant.
    2. Start the fan and soap test all casing connections and openings to ensure that no leakage takes place. Inspect entire casing to ensure that no undue movements have taken place.
    3. Close all drainage openings. Fill bottom of casings with water to the level of the waterproofing. Let stand for two (2) hours, no leakage allowed.
    4. Start and stop each fan at least five (5) times. Ensure that each fan is free wheeling and does not produce any abnormal vibration at any speed. Allow proper time integral between starts to motor manufacturers requirements.
  2. Operate all systems to full capacity and verify proper, safe efficient operation of all parts and each complete system in all its sequences of operation and expected conditions. Oil motors and grease bearings before operating equipment.
  3. Turn over to Owner, necessary keys, handles and operating devices for each system.
  4. Mechanical Trade Contractor shall employ and cooperate with Balance/Test Company and supply sufficient manpower, tools, scaffolds, ladders, etc., to enable each system to be suitably tested and adjusted to give required performance. Balance all water systems to obtain flows specified. Provide test/balance reports on all items.
  5. Provide and locate all necessary access doors, system thermometers, pressure gauges, flow taps and valves shown or specified in proper locations to direction of Balance/Test Company. Note that tradesmen must be supplied to properly assist work of balancing company, including assistance with clean hands or toss away protective gloves required to remove ceiling tiles, guards or access doors, or similar for testing and placing them back in a clean condition when balancing work is finished.
  6. Adjust equipment, valves, splitters, dampers, controls, drives and speeds necessary to put each system into its proper design operating condition to direction of Balance/Test Company. Each system shall be within 3% of design figures.
  7. For condensing units, ERV's and EF's at start up of unit, checking of controls, setting of switches, balancing of drives, and balancing of all air flow shall be performed by service personnel who are trained in servicing this equipment and whose only function is service work. Two subsequent service calls at 3 months and 6 months shall be performed to check operation of unit and switches, and to check all filters.
8. Instructions to Operator
  1. This Supply Contract includes all provision of instruction and training to Owner's Building Operator in care, maintenance and operation of the equipment and its components and relation to other systems. See 200500 and 200501 for further detail.

**END OF SECTION**

## 1. GENERAL

### 1. General Instructions

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated herein.
2. All electrical trade contractors and bidders shall inspect the complete architectural drawing package, including but not limited to Site Arrangement Plans, as these documents provide items of work that pertain to all disciplines.
3. The Electrical Trade Contractor (as Subcontractor to the Contractor) shall contract for all portions of the Work (the Electrical Part of the Work) as follows:
  1. All Electrical Systems, including work that relies upon descriptions of materials, methods, or quality set out in other specification Divisions which are referenced therein;
  2. All Site Electrical Work, as indicated on drawings and schedules;
  3. indicated on the Facility electrical drawings and schedules; and
  4. all related work and services as set out or referenced in Division 1 General Requirements, and the Conditions of the Contract, as they may affect the Electrical Part of the Work.
4. The Electrical Trade Contractor shall organize and accept bids for aspects of the Electrical Part of the Work from Suppliers and Subcontractors as set out in these specifications, and shall be fully responsible for the Electrical Part of the Work, including all such Subcontracts and Supply Contracts. Any variance from the assignment of responsibilities within the Electrical Trade Contractor's chosen methods of subcontracting and/or organizing of the Electrical Part of the Work shall not relieve the Electrical Trade Contractor of any responsibility set out anywhere in the Contract Documents that is assigned to it.
5. The work and services described by this Section and its further references are required by the Contract and shall govern all Electrical Work as if repeated therein.
6. The Contractor and all Trade Contractors and all bidders shall carefully inspect all sections and divisions of the bid forms, the specification in its entirety, and the drawings, and any addenda to ensure that work described in this section and the electrical specification is understood together with all related items required by the Contract. Requirements for this inspection are set out in Division 1 as well as the General and Supplementary Conditions of the Contract.
7. The Contractor and all bidders in the contract bidding hierarchy shall solicit and determine the potential and intention for its Subcontractors and Suppliers to in turn provide bids to it for aspects of the Work, and shall provide a lead letter to them outlining the method and manner of the division of the Work as proposed, including requirements for the work schedule. All costs, organization and timing of the aspects of the Work required to achieve the contract schedule are included in the Contract Amount.
8. All bidding Trade Contractor Subcontractors and Suppliers shall review the bid forms well prior to bid closing, and shall provide all bid information required to enable the bidding General Contractor to complete all required bid forms with all required bid information in a timely manner.
9. Comply with the bidding provisions for bidding, inclusion of taxes, examination of existing conditions and reference documents and bidding procedures. This information is set out in Division 0 of the specifications.
10. Definitions and general contract procedures are described in the Articles, Definitions, General Conditions, Supplementary Conditions, Section 002000 Reference Documentation, and Division 1 of the specification.

11. Additional requirements may be specified on drawings or in specification sections. Comply with the most stringent requirements wherever stated or reasonably implied.
12. Organization of the Documents
  1. Nothing in the organization of the Bid and Contract Documents shall imply a division of the construction and related services that are required by the Contract into separate units of work or subcontracts unless specifically so stated. The Contractor shall perform the Work as one integral construction, and shall arrange for the division of the Work to best ensure its timely performance by qualified workmanship as set out in Division 1 of the Specification.
  2. The technical sections of this and others Divisions are artificially divided into sections for ready reference purposes only. The Consultant shall not act as an arbiter or establish the division of requirements of the Contract into units or Subcontracts of any kind unless specifically so stated. Particular specification sections of this or other Divisions shall always be read within the context and requirements of the General Work Requirements of this Division, which shall always be read within the context and requirements of Division 1, and in turn within the general terms and conditions of the Contract.
  3. In general, and without limiting specific requirements stated elsewhere, the construction and related services described in this Division shall be understood within the context of specific Building Systems as defined and set out in Division 1. Responsibility for the achievement of contract requirements with respect to each Building System is the Contractor's, and may in turn be required to be further and additionally assigned by the Contractor to a specific trade contractor as set out in the Documents.
  4. The Contractor, all bidders, and the trade contractors shall carefully review the requirements for Building Systems as set out in the Contract, and shall include all costs to perform the Work to these requirements.
  5. Drawings for Building Systems are schematic diagrams only, and do not govern the specific quantity of work, organization, design, Product, or material required to achieve conformance with Contract requirements.
13. Mention in the specification or notation or indication on Drawings of Products, materials, operations or methods means the Contract requires:
  1. Supply of each item mentioned or indicated, to exceed specification provisions for quality, and subject to any particulars or qualifications noted;
  2. Installation according to conditions stated or inferable and as required to contribute to the Building Systems of which it may form part;
  3. Successful provision of performance requirements of the components and the Building systems of which it may form part, for each operation or method prescribed or anticipated by the design and
  4. The finished Work, with the furnishing of all necessary labour, equipment, and incidentals to achieve the above.
14. Where used, words "Section" and "Division" shall be deemed to mean the Contractor and the particular Trade Contractor or Subcontractor who shall provide the work of this Contract or such aspect of the work to make the building system, finished work and site complete in all respects, and achieve system performance.
15. "Supply" is defined in Section 016010, Basic Product Requirements.
16. "Install" is defined in Section 017010, Basic Execution Requirements.

17. *"Provide"* means to supply and install.
18. *"Exposed"* means work normally visible, including work in equipment rooms and similar spaces
19. *"finished area"* means any area or part of an area which receives an in-situ finish or factory finish.
20. *"governing authority"* and/or *"regulatory authority"* and/or *"Municipal authority"* – means all government departments, agencies, standards, rules and regulations that apply to and govern the electrical work and to which the work must adhere
21. *"O&M"* – means Operating and Maintenance
22. Where used, wordings such as "as directed, permitted, permission, accepted, acceptance, report to", shall mean "by Consultant" in each case.

## 2. Existing Conditions

1. All bidders shall visit the place of the Work and examine in detail the existing conditions as set out in Section 002000 Reference Documentation, the documents in their entirety, and the place of the Work prior to submitting an offer for the Work or any of its aspects. No additional costs will be considered by the Owner for conditions and requirements that are reasonably inferable as necessary for the Work from such examination of the Place of the Work, existing site, or building systems, including within accessible portions of existing ceiling spaces and below existing slabs-on-grade.
2. Requirements for this inspection are set out in Division 1 as well as the General and Supplementary Conditions of the Contract.
3. No additional claims or costs will be accepted after bidding and contract award because of claimed unfamiliarity with existing conditions.
4. Existing building systems at the Place of the Work must be maintained until new systems or changes to systems are functional and accepted by the Owner in accordance with the Contract, unless written permission is given by the Owner for early decommissioning of such systems.

## 3. Abbreviations

1. Many words or expressions that are repeated frequently on the drawings or within the specifications are abbreviated to reduce the amount of wording that might obscure the detailing. To avoid misinterpretation, these abbreviations are listed, with their full meaning, in Section 011090 and elsewhere in the documents using legends and notes.
2. The Consultant's interpretation of the meaning or intent of an abbreviation shall be consistent with the intent of the Contract, but such finding shall be final. In all cases where meaning is not immediately clear, or is capable of varying interpretation, contact the Consultant for clarification before proceeding with the aspect of the Work affected.

## 4. Special Project Requirements

1. General requirements for accommodating the ongoing operation of the construction and systems, for hoarding and security, for products likely to off-gas during and subsequent to their installation, and construction sequencing requirements are set out in the architectural drawing set, and in Section 011020 and other sections of Division 1. Trade Contractors shall adhere to these requirements in strict cooperation with the Contractor. Co-ordination of costs for these requirements shall be clearly set out by the Trade Contractor and Contractor in their agreement. No additional costs will be accepted by the Owner for the failure of the Contractor, a Trade Contractor Subcontractor, or Supplier to incorporate these project requirements into its bidding or performance of its aspect of the Work.

2. Contractors are also hereby notified that all work must be in accordance with the regulations of authorities regarding workplace safety and the use of ladders in the everyday maintenance of building systems. All electrical elements requiring maintenance shall be placed accessibly, so that the Owner's ladders and work platforms can be used to safely perform regular maintenance requirements.
3. Trade Contractors are hereby notified that this Contract includes the performance of aspects of the Work within the occupied areas of the Building Landlord's facilities. Cooperate fully with the Contractor for the organization and performance of such aspects of Work, including off-hours work, multiple mobilizations and return of work areas for the Owner's, Building Landlord's or Landlord's Tenant's daytime use, special provisions for temporary systems to ensure use of systems is not interrupted, and other measures all as reasonably required to minimize inconvenience and disruption of existing operations.
4. The Work must be performed in accordance with requirements for behaviour, decorum, and workplace culture as set out in Division 01.
5. Schedule of Values, Allowances, Claims for Payment, Changes in the Work
  1. All construction and related services within the Work has monetary value, which shall be itemized in the Contract Schedule of Values. No certification of value can be provided by the Consultant where an aspect of the Work is not performed. Trade Contractors shall co-operate with the Contractor in providing a full and complete breakdown of the Work in accordance with Section 012010, which shall govern as if repeated here.
  2. Cash and Contingency Allowances are described in Section 012020 of the specification.
  3. The intent of this specification is that all allowances shall be carried by the Contractor, not by individual Trade Contractors or Subcontractors. Contractor shall read entire specification prior to bidding and shall include in Stipulated Price Contract Sum, all allowances called for in this or any Section of Specifications or drawings. If allowances specified herein are repeated in other Sections, or if allowances are specified in other Sections but not listed in this Section, Subcontractors and Contractors are requested to inform Consultant immediately in order that action may be commenced to implement the express intent that all allowances be carried by the Contractor only.
  4. Claims for payment shall be made in accordance with Section 012030. Trade Contractors shall provide all information necessary for the Contractor to fully account for all portions of claims for payment.
  5. **Requirements for the valuation of changes in the Work are set out in Section 012040. The Electrical trade contractor shall provide pricing for changes in accordance with the National Electrical Contractors Association (NECA) Manual of Labor Units, latest published version, at base rates without inclusion for inefficiencies or job conditions unless with the consent of the Consultant, less 25%.**
6. Project Meetings
  1. Requirements for project meetings during the construction period are described in Section 013010 of the specification.
  2. Trade Contractor participation and attendance at Pre-construction, Progress, Pre-Takeover, and Post-Construction Meetings is required. Trade Contractor representatives attending such meetings shall be the authorized representatives assigned responsibility for building systems and commissioning as set out in Sections 018010 and 019010.
  3. The Contractor and Trade Subcontractors shall hold regular Interference and Co-ordination meetings to ensure the timely and proper co-ordination of the Work. The Contractor shall submit proceedings of such meetings to the Consultant within four business days of such meeting.

4. The Electrical Trade Contractor shall schedule and organize during initial phases of project start-up a workshop session with the Consultant to review and consider the means and methods proposed by the Contractor for installation of the electrical systems, and to ensure that the location, intent, and requirements of the systems are clearly understood by the Contractor and trade contractors who will perform the work.
7. Construction Schedule
  1. The requirements for the scheduling of construction, and the requirements for submitted schedules relating to the timing of submissions, cash flow, and product delivery are described in Section 013020 of the specification.
  2. No additional claims or costs will be accepted after bidding and contract award because of claimed unfamiliarity with the Contractor's proposed schedule, including off-hours, holiday, and overtime work required to meet such schedule, by any Trade Contractor or Supplier.
  3. All Trade Contractors shall solicit and obtain the Contractor's proposed schedule and organization of the Work prior to submitting a bid for the Work. Include all costs relating to such scheduling.
  4. All Trade Contractors shall provide services required to review, prepare, and update the schedules required for submission to the Consultant as set out in Division 1.
8. Submittals
  1. General requirements and procedures for preparation, inspection and certification, and provision of all submittals is described and referenced in Section 013030. All Trade Contractors and the Contractor shall adhere to the requirements set out in that Section, and elsewhere within the Contract Documents, in providing submittals and shop drawings that are required anywhere in the Contract Documents.
  2. Review of Submittals and Shop Drawings by the Consultant and/or Owner is for the sole purpose of ascertaining conformance with the general design concept. This review shall not mean that Consultant accepts detail design inherent in Submittals and Shop Drawings, responsibility for which shall remain with the Contractor and Trade Subcontractors and Suppliers as applicable, and such review shall not relieve the Contractor, trade Subcontractors, and Suppliers of responsibility for errors or omissions in the submittals and shop drawings or of responsibility for meeting all requirements of Contract Documents. The Contractor is responsible for dimensions of equipment to be confirmed and correlated at site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co ordination of work of all trades. Trade Subcontractors shall cooperate in such co-ordination and shall provide information accurately and completely in a timely manner to achieve Contract Requirements.
  3. Provide for all work described by the Electrical Documents inclusive the following submittals whenever requested by the Consultant, at trade contractor and Contractor expense:
    1. Sleeving Drawings:

To clearly and accurately determine the exact location, elevation and size of any and all formed holes, recesses and sleeving required to either existing conditions or new work. Provide a copy of accepted sleeving drawings to the reinforcement detailer well in advance of planned precast concrete fabrication, concrete pours and masonry construction. Design sleeves to allow for movement of element penetrated.
    2. Access Door Drawings:

To clearly and accurately set out location, elevation and sizes of all access doors required to either existing conditions or new work. Provide a copy of the accepted access drawings to the appropriate installation trades well in advance of need.

3. Detail Drawings:

To clearly set out and interrelate all existing conditions and new work in shafts, pulling pits, equipment bases, anchors, floor and roof curbs, equipment areas and rooms, service rooms and utility rooms. Base layouts on accepted Submittals and Shop Drawings and include, but do not necessarily limit to, details pertaining to access, clearances, tappings, sleeves, electrical connections, service spaces and clearances for services and removals of components, and integral control drawings.

4. Composite Building System diagrams:

Of each specific electrical building system. Provide diagrams to reference and relate all component wiring and control mechanisms, and clearly establish control wiring and other control connections among the system components, both internal and external, for review and coordination of trades. Ensure that the diagrams clearly and separately demonstrate the methods of control that will achieve operation and performance of each and every sequence of control and each operating condition required of the system or to which the system shall be exposed in its service life. Ensure that all inputs into the building system from existing elements and other systems are specifically shown and listed together with all requirements for such elements external to the system. Ensure that all outputs from the system to existing elements and other systems are specifically shown and listed together with all requirements for such outputs and the means to achieve them. Distribute the diagrams to related Trade Contractors and obtain acceptance and certification by Building System commissioning representatives to which they relate, as set out in Division 1.

5. Co-operate with work of Mechanical Trade Contractor and provide data requested and as required in their preparation of interference drawings for the Mechanical Part of the Work.

4. Contractor's Material and Test Certificates: Prepare and submit certificates for each building system. Where certificates are prescribed by regulations, codes or standards ensure they conform to the requirements of those documents. Include a copy of each certificate in the Operation and Maintenance Manual. Certificates shall include, but are not limited to the following:

1. Description of the system;
2. Description of all tests conducted and results observed, including re-testing;
3. Description of any corrective measures undertaken;
4. Description of materials used;
5. List of witnesses for each test conducted;
6. Date system left ready for service; and
7. Signature of installing Trade Contractor and Building Systems Commissioning representative as set out in Division 1.

5. Submit in accordance with Division 1, and for each electrical building system, the following:

1. A list of all products and materials complete with manufacturer and product numbers for Contractor's Material and Test Certificates.
2. Photographic documentation of new portion of system, and existing systems affected by the work described in this Section that will not be exposed in the finished Work.
3. As-built and record drawings in accordance with Division 1 requirements.
4. Records of tests and certifications of the system at rough-in and completion. This includes a test of the emergency lighting system, acceptable to authorities and the Consultant.
5. Record of acceptance of the system by authorities having jurisdiction. This includes the Utility and the Electrical Safety Authority.
6. Copies of all material and test certificates, system inspection reports, tests including failed tests, preliminary and final balancing reports, and certification of system to meet codes and regulations.
7. Copies of factory tests for all equipment.

8. Copies of all maintenance information and recommended spare parts lists for equipment.
  9. Manufacturer and product warranties, system warranties, in accordance with requirements of Division 1 for warranties.
6. Submit a list of proposed nameplates for acceptance before manufacturing.
9. Co-ordination
1. General requirements and procedures for co-ordination and layout of the Work, of its component parts, its relation to conditions and utilities whether existing or new, and whether provided under this Contract or by authority or utility, and for cutting and patching, is described and referenced in Section 013050. All Trade Contractors and the Contractor shall adhere to the requirements set out in that Section, and elsewhere within the Contract Documents, in co-ordinating the parts of the construction and services that are required anywhere in the Contract Documents, and in performing the work described therein.
  2. Perform the total construction and related services so that requirements for cutting and alteration of existing elements and new construction are eliminated wherever possible. Where not possible, perform cutting and patching using trades fully qualified in the installation of the material being cut. Trade Contractors installing the item requiring to pass through do not perform the cutting and patching, although the cost of such cutting and patching shall be borne by that Trade Contractor.
  3. The sequence of installation of building systems shall be planned by the Contractor and all Trade Contractors to facilitate the performance of the systems and the achievement of the design intent. The Contractor and all Trade Contractors shall take special care in the planning of the Contractor's sequences of installation that the inherent requirements of building systems dependent upon gravity, head pressure, or similar factors shall be installed early in the construction sequence to ensure that such performance is optimized.
  4. The order of precedence of building systems for the purposes of co-ordinating the installation shall be as described in Section 019010, and generally as follows:
    1. Building Structural System takes precedence over,
    2. Location of exposed devices and building elements in architectural elements such as ceilings, over
    3. Location of systems in exposed architectural locations over,
    4. Location of non-pressurized liquid systems functioning by gravity, over
    5. Pressurized liquid systems requiring maintenance drainage, over
    6. Pressurized air distribution systems, over
    7. Pressurized liquid and gas systems, over
    8. Electrical distribution systems.
  5. Electrical Drawings do not show structural, architectural, and related details. Take information involving accurate measurement of building from building drawing notations, and also at building from existing conditions.
  6. Properly plan, coordinate and establish the locations and routing of services with all Trade Contractors affected prior to installation such that the services will clear each other and any obstructions. Unless otherwise specified, the order of right-of-way for services is as follows:
    1. piping requiring uniform pitch
    2. piping 100 mm (4") diameter and larger
    3. large air ducts (main runs)
    4. electrical cable tray and bus duct
    5. conduit 100 mm (4") diameter and larger
    6. piping less than 100 mm (4") diameter
    7. smaller branch ductwork
    8. conduit less than 100 mm (4") diameter.

7. Furnish "built in" items in ample time and give necessary information and assistance in connection with building in of same. Notify Trade Contractor concerned in writing of size and location of recesses, openings and chases at least 48 hours before walls are erected, floors poured and similar work.
  8. Where not sleeved, make holes through steel, concrete walls, floors and elements by hole drilling and concrete core drilling only. Verify location of structural reinforcing and concealed conduit and systems using appropriate methods such as x-ray, and obtain Consultant's acceptance before drilling. Under no circumstances core drill existing or new structural steel, precast, pre- or post-tensioned concrete structure without written acceptance of the Consultant for each individual location. Obtain a professional engineer's review and acceptance at no cost to Owner upon request of Consultant.
10. Reference Standards and Codes
1. The relation of the Work to Reference Standards and Codes is described in the General Conditions and Supplementary Conditions of the Contract, in Section 014020, and elsewhere in the Contract Documents.
  2. Conform to the contract requirements, regulations, and legislation of authorities having jurisdiction, as in force where the Work is located, meeting the more stringent requirement in each situation.
  3. Apply for, obtain, and pay for all permits and inspections required by authorities having jurisdiction, including electrical permits and ESA reviews where required by legislation, with the exception of the municipal building permit only.
  4. Furnish necessary certificates as evidence that work installed conforms with laws and regulations of authorities having jurisdiction.
  5. Conform to the recommendations of the organizations listed in Section 014020 for good practice, use standards and codes referenced wherever in the Contract, in whole or in part, in their most recently revised or amended form, as specifically requested in the Specification and as applicable in normal industry practice:
    1. to the performance of the Work,
    2. to the interrelation of Products and their components,
    3. to the installation of such Products and execution of related services.
  6. Equipment and work provided under the Electrical Divisions shall conform to applicable standards and regulations of the following organizations:
    1. Canadian Standards Association (CSA) Standards
    2. Underwriter's Laboratories of Canada (ULC) Standards
    3. Ontario Electrical Safety Code (OESC) and Bulletins
    4. Canadian Underwriters Association (CUA) Standards
    5. National Building Code (NBC) (except where in conflict with the OBC)
    6. Ontario Building Code (OBC)
    7. National Fire Protection Association (NFPA) Standards
    8. National Electrical Contractors Association (NECA) for Manual of Labor Units
    9. Electrical and Electronic Manufacturers Association of Canada (EEMAC) Standards
  7. Minor changes required by an authority having jurisdiction shall be carried out without change to the Contract amount. Standards established by drawings and specifications shall not be reduced by applicable codes or regulations.
  8. File Contract Drawings with proper authorities and obtain their approval of installation and permits for same before proceeding with work. Prepare and submit necessary detailed shop drawings & designs as required by Authorities. Any first submission of plans and specifications to ESA will be made by the Consultant where size of service or panels requires.

From then on, and in the case where no preliminary submission has been made, the Electrical Trade Contractor shall be responsible for obtaining & complying with all requirements of ESA.

9. Pay all fees in connection with examination of drawings, permits, inspections and final certificate of approval by authorities having jurisdiction. This includes premiums for after office hours and weekend/holiday inspections.

#### 11. Quality Control

1. General requirements for quality control are described in Section 014050. Workmanship and method of installation shall conform to best standards and practice and be performed to acceptance. Work shall be done by tradesmen skilled in the aspect of the work they perform. Where required by local or other By Laws or Regulations, tradesmen shall be licensed in their trade. Install work and equipment to manufacturer's printed directions for this specific contract.
  1. Trade workers to have a Certificate of Qualification as Journeyman or Apprentice Registration for the Place of the Work or an Interprovincial Certificate.
  2. Ratio of journeyman to apprentice: not to exceed ratio in Apprenticeship Act of Ontario.
  3. Certificates and Registration must be provided to the Consultant on request.
  4. Maintain on-site an up-to-date record listing journeyman and apprentices working on site.
2. The Contractor, on request, will supply Trade Contractors with necessary levels and dimensions that are required to relate work described in the Electrical Documents. Maintain all lines and levels so given.
3. Tolerances for the installation of the Work are defined and set out in Section 014050 as well as elsewhere in the Documents and as established by manufacturers and suppliers of Products. Conform to the most stringent requirements.
4. Temporary or trial usage of any device, machinery, apparatus, equipment, system, or materials shall not be construed as evidence of acceptance of same by either Consultant or Owner. No claim for damage shall be made for injury to or breaking of any part of such work that may be so used. The Contractor remains responsible for all elements of the construction until final acceptance of the Work in its entirety.
5. Provide testing of components and systems wherever required by the Consultant, by applicable law, code or regulation, by authorities having jurisdiction, and where stated in the Documents. This includes factory and off-site testing as well as at the Place of the Work.
6. Submit in accordance with general provisions all written record reports of all tests and of all certificates from independent agents certifying compliance and acceptance, including preliminary reports and reports involving failed tests.
7. Rough copies of test reports must be submitted by facsimile to the Consultant within 3 business days of date of test. Final issued copies of test reports must be submitted within 14 days of date of test. Work upon which the tested component or system depends, and work to cover such systems or components, proceeds at the Contractor's and applicable Trade Contractors sole risk until review and acceptance of successful test certifications and reports by the Consultant.

#### 12. Temporary Facilities

1. Temporary measures, required environments, and facilities for the performance of the Work are described in Sections 015010 and 015033. Conform to such requirements. The Contractor shall ensure such conformance and shall provide such measures and co-ordinate responsibility for such requirements among Contractor and Trade Contractors.
2. Each Trade Contractor is responsible to create suitable working environment for its workers and the products and materials being installed, and for protection of such products and materials prior and after installation until final acceptance of the Work, unless specific arrangements for such protection and environments have been made with the Contractor.

3. The Electrical Trade Contractor shall provide electrical work to the Contractor for the installation of temporary power and construction power. Electrical Trade Contractor and Contractor shall co-ordinate costs during the bidding period, to ensure temporary work for ways and means is understood and priced only once.
4. Provide temporary office, workshop and tools and material storage space as necessary for the electrical Work and assume responsibility for any loss or damage thereto. Buildings erected for this purpose shall conform in appearance to those erected for similar purposes under other Divisions of Specification.
5. Provide temporary lighting for whole construction area, to light levels commensurate with safety and the requirements of the Work. Coordinate with General Contractor for requirements.
6. Provide scaffolding and shoring necessary for work of the Electrical Part of the Work. Scaffolding and shoring shall be adequate to protect the workmen according to Provincial and Local Regulations.
7. Provide rigging and millwrighting, labour and equipment necessary for the Electrical Part of the Work. Employ only workmen well experienced and skilled in such trades for this portion of the work.
8. Provide hoisting machinery, operators, labour and materials necessary to lift and place equipment supplied under the Electrical Part of the Work.
9. The permanent systems or any part thereof shall not be used during construction for construction purposes, unless so permitted by the Owner in writing.

### 13. Safety Requirements

1. General requirements for safety are described in the General Conditions and Supplementary Conditions of the Contract, and in Sections 015045 and 015046.
2. Specific requirements for safety and operations in relation to existing conditions and the Owner's operations and facility are described in Division 1.
3. Conform in all respects to the requirements for safety described in the Contract Documents, and applicable legislation and regulations referenced therein.
4. Provide on all corners and edges of equipment, ductwork piping, hangers and obstructions mounted less than 2 m above floor in electrical type rooms, suitable pre-manufactured and purpose-designed foam rubber edge guards to protect persons from injury.

### 14. Environmental Protection

1. Measures and facilities for the protection of the environment during performance of the Work are described in Section 015060. Conform to such requirements. The Contractor shall ensure such conformance and shall provide such measures and co-ordinate responsibility for such requirements among Contractor and Trade Contractors.

### 15. Basic Product Requirements

1. Requirements for Products and supply of Products is described in Section 016010. Conform strictly to such requirements.
2. All equipment, controllers, and systems must restart automatically upon re-activation of electrical power, following power failure, and resume their sequence of operation without manual intervention.
3. Alternatives & Substitutions

1. Throughout the Electrical Documents are lists of alternative manufacturers acceptable to the Consultant & Owner. These manufacturers have been deemed to have the ability to supply materials and product that meets the characteristics of the specified or described product or material item. Such products or materials may need to be customized or otherwise worked to achieve the characteristics required by the design and the Contract. The Contractor is cautioned that neither the Owner nor Consultant have made extensive investigation of the particular material or product characteristics of alternative manufacture to ensure that such products or materials meet the requirements of the Contract.
  2. Each Bidder may elect to use alternative products or materials from such lists, providing that the bidder investigate and determine any required changes or customization of the product or material necessary to ensure the performance of the building systems of which it forms part, its interrelationship with adjacent components, and achievement of the contract requirements.
  3. The Contractor and the Trade Contractor responsible for the building system in which a product or material is to be installed shall ensure alternative products fit space allotted, provides all specified features, and gives performance specified. If an alternate product or material is proposed by the Contractor or Trade Contractor and does not fit space allotted nor is equivalent to the specified product in Consultant's opinion, regardless that the manufacturer has been nominated as an accepted alternative manufacturer, supply of the specified described product will be required without change in Contract Amount or Contract Time. Only manufacturers stated as specified or as acceptable alternative will be accepted for the bidding of the Contract. All other manufacturers shall be quoted as a Bidder's Alternative on the bid forms in accordance with provisions within the bid forms, accompanied by requested information and stating conditions and credit amount that may be applied to the Bid Price upon acceptance of the alternative by the Owner.
  4. If a Product or material specified or described is unobtainable, the use of a proposed substitute Product or material shall be shown on the Bidder's Alternative section of the bid forms, together with an amount added or deducted from the Bid Price for its use. Extra monies will not be paid for substitutions after Contract has been awarded.
  5. If an item of a size or weight or capacity required by the Contract is unobtainable, supply next larger size or capacity or heavier weight without additional cost to the Owner.
16. Basic Execution Requirements
1. The general requirements for execution of the Work are described in Section 017010.
  2. Each Trade Contractor shall:
    1. Co-ordinate the execution and layout of out their work and be responsible for any damage caused to other Trade Contractors or Owner by improper location or carrying out of same.
    2. Be responsible for prompt installation of work in advance of other portions of the Work upon which the Trade Contractor's work depends and to facilitate diligent and orderly progress of the Work.
    3. Protect all finished and unfinished work and existing conditions from potential damage by performance of work described in the Electrical Part of the Work. Co-ordinate protection with the Contractor.
    4. Be responsible for condition of material and equipment supplied. Be responsible for protection and maintenance of work completed until termination and acceptance.

3. **Electrical Drawings are diagrams, and do not show the integrated construction required by the Contract. Take information involving accurate measurement of conditions from noted measurements on all Contract drawings, and at the Place of the Work, and verify all dimensions prior to performing work upon which such dimensions depend, wherever located. Make, without additional charge, any necessary changes or additions to runs of piping, conduits and ducts to accommodate existing conditions and the requirements of other parts of the Work. Route systems for best appearance, neat and straight in conformance with structural and architectural elements. Location of conduits, devices and other equipment may be altered by Consultant without extra charge provided change is made before installation and does not necessitate major additional material. Do not scale drawings.**
4. As work progresses and before installing finish devices and elements of systems such as outlets, luminaires, sensors, fixtures and other fittings and equipment that may interfere with interior treatment and use of building, obtain detailed instructions for exact location of such equipment and fitments. Ensure that installation of finish devices and equipment is performed upon completion and acceptance of surrounding finished elements.
5. Electrical Drawings indicate general location and route of conduit, devices and fixtures that are to be installed. Where required work is not shown or only shown diagrammatically, install same to conserve headroom (minimum 7' 3" or 2200 mm clear) and interfere as little as possible with free use of space through which they pass. Conceal piping, conduits and ducts in furred spaces, ceilings and walls unless specifically shown otherwise. Install work close to structure so furring will be small as practical. Install work within partitions at highest practical height to maintain free area for Owner's future alterations to partitions. Provide minimum service clearances as shown in drawings, as required by applicable Codes and Standards and manufacturer's recommendation. Where no written guidance exists, maintain minimum 24" (600 mm) service space around serviceable units and as required for maintenance access and replacement of internal components.
6. Install conduit and devices to clear structural members and any fireproofing or rated assemblies that are to be applied to such members. Locate electrical work to permit installation of specified insulation. Do not remove or damage structural fireproofing or protections. Suspended elements or units of other construction shall not be obstructed from easy removal by interfering pipes, ducts, conduits or any other obstruction below the units.
7. Before commencing work, check and verify all sizes, locations, grade and invert elevations, levels and dimensions to ensure proper and correct installation. Verify exterior utility services.
8. Locate all electrical equipment in such a manner as to facilitate easy and safe access to and maintenance and replacement of any part.
9. In every place where there is indicated space reserved for future or other equipment, leave such space clear, and install piping and other work so that necessary installation and connections can be made for any such apparatus. Obtain instructions whenever necessary for this purpose. Do not proceed in uncertainty.
10. Relocate equipment and/or material installed but not co-ordinated with work of other Sections as directed, without change in the Contract Amount or Time.
11. All components of equipment must installed to be easily accessible for service. Consult with Consultant if intended design layout has to be modified to maintain service access shown on manufacturer's instructions or drawing details for component installation. As described elsewhere in this Section, co-ordination and planning of layouts, together with submittals and review of all conditions of the Work is a requirement of this Contract.
12. Securely plug or cap open ends of electrical raceways or equipment to prevent entry of dirt, dust, debris, water, snow or ice. Clean all equipment inside and outside before testing.

13. Equipment stored on site shall be protected from weather and kept dry and clean at all times. Take care to avoid corrosion of metal parts.
14. Protect work installed from damage. Secure all unfinished or loose work to prevent movement.
17. Cleaning and Construction Waste Management
  1. Requirements for cleaning and the management of construction waste and recyclable materials during the progress of the Work and at the various stages of final completion of the Work are described in Section 017041 and 017042.
  2. Without exception and in addition to any requirements of the Contractor, each Trade Contractor is responsible for cleaning the Place of the Work on a daily basis to ensure that all effects of its construction operations and execution of the aspect of the work for which the Trade Contractor is responsible achieve the orderliness and cleanliness of the Place of the Work required at the end of each working day. Each day, Trade Contractors shall remove from the Place of the Work surplus materials and debris resulting from the Trade's activities. Keep work areas clean and in a workmanlike manner at all times to acceptance of the Contractor, Consultant and Owner.
  3. The Consultant may issue instructions to the Contractor to clean or manage waste and recyclables in accordance with Contract requirements whenever deemed necessary, including for special cleaning by outside cleaning forces at Trade Contractor expense.
  4. Immediately prior to completion of work:
    1. Remove all dust, dirt and other foreign matter from internal surfaces of enclosed electrical apparatus and equipment.
    2. Remove all temporary protective coverings and coatings, temporary labels.
    3. Clean, repair, lubricate and adjust all mechanism and moveable parts of apparatus and equipment leaving it in new condition and operating properly.
    4. Balance demand loads for service and distribution feeders within 5 percent upon completion of work and after the building is in full operation.
18. Contract Closeout
  1. Requirements and definitions for identification of defects and deficiencies, correction of same, substantial performance of the Work, and completion of the Work are described in Section 017070. The Contractor and all trade contractors shall conform to these requirements in all respects.
  2. The Contractor, and more particularly the Trade Contractors performing work to building systems, are cautioned that accomplishment of the Work involves both construction and related services. The related services have monetary value within the contract amount, and failure to perform related services in a timely manner to facilitate completion of the Work shall result in a finding of defective work by the Consultant, with related deduction of such monies from the Contract Amount.
  3. Provide receipts from designated representative of Owner for portable and loose materials.
  4. Application for final review will be considered when the Work has been completed and written declarations submitted that all commissioning, testing adjustment, set up and documentation is complete. Consultant's final review shall be done when:
    1. All reported deficiencies have been corrected.
    2. All systems have been balanced, tested, commissioned and are operational.
    3. The Owner has been instructed in the operation and maintenance of all equipment.
    4. All reports have been submitted and reviewed.
    5. All maintenance manuals have been submitted and reviewed.
    6. All tags and nameplates are in place and all data submitted and reviewed.
    7. Cleaning up is finished in all respects.

8. All certificates are furnished.
9. All spare parts and replacement parts specified have been provided.
10. All record drawings have been submitted and reviewed.

#### 19. Commissioning

1. Start-up, commissioning, and final commissioning are defined terms within this Contract, as described in Section 018010. No industry practice or common understanding shall detract from the definition of these terms as set out therein.

The Contract requires that each Building System be overseen by a System Commissioner, who shall be an authorized representative of the trade contractor responsible for the system. The System Commissioner shall perform all functions as assigned in Division 01, working in cooperation with the Contractor's Commissioning Co-ordinator.

2. The Contractor and all Trade Contractors shall start up components, perform commissioning of systems, and perform final commissioning of systems as described in Section 018010 and elsewhere in the Contract Documents for particular systems, including all aspects of their operations. Where these operations are not performed to the satisfaction of the Consultant, by their sole criteria and judgment, perform or re-perform these requirements at no additional cost to the Owner as many times as instructed and as necessary to achieve the complete commissioning intent of each system and other systems upon which the system depends.
3. Separately start up all electrical equipment and commission each system and then all related systems through all cycles and seasons.
4. Instruct Building Operators in repair, maintenance and operation of systems and equipment.
5. Arrange for on-site instruction by any product manufacturers where considered necessary by Consultant, or requested in the Contract Documents, at no additional cost to Owner.
6. Test systems to the satisfaction of the Consultant, and as required to establish compliance with plans and specifications, and with the requirements for the Supply and Inspection Authorities.
7. Faulty and defective equipment shall be replaced with new materials. Conductors that are found to be shorted or grounded, or to have less than proper insulation resistance, shall be replaced with new conductors.
8. At time of final commissioning, and in addition to other aspects of commissioning work, re-torquing all bolted connections in all distribution equipment
9. Tests shall include but are not limited to the following:
  1. Test of secondary voltage cables shall include megger tests to establish proper insulation resistance, and phase to ground resistance of cables.
  2. Proper functioning of all systems.
  3. Polarity tests to establish proper polarity connections to all sockets and receptacles.
  4. Test of system neutral to establish proper insulation resistance and isolation of neutral from ground except for required ground connection at Service.
  5. Calibration all aspects of systems and components to ensure optimal function.
10. Trial usage of any equipment or materials shall not be construed as evidence of acceptance of same and no claim for damage shall be made for injury to or breaking of any part of such work which may be so used.
11. Provide all work for equipment start-up, system start-up, commissioning, and final commissioning of building systems described in the Electrical Part of the Work, in accordance with requirements described in Division 1.

12. The Electrical Contractor shall carry in their bid the cost for all performance testing of equipment and systems. This includes all equipment, labour, instruments, expenses of the manufacturer's representative, and incidentals, and all power and fuel.
  13. Submit the record of all tests and have these tests signed by Consultant or Contractor's Superintendent and, where applicable the manufacturer's representative. Show in schedule form a record of the systems or parts of systems tested, the date of the test, the circumstances such as current, temperatures, etc., the duration of the test and any special remarks pertaining to events during the test. Note which tests have been witnessed by authorities having jurisdiction.
  14. Submit certification letters from the manufacturers of all equipment certifying that their technical representatives have inspected and tested their equipment and are satisfied with the methods of installation and operation. Where existing systems are extended and or modified, provide letters covering both new and existing equipment and connections. These letters shall state the names of persons present at testing, methods used and a list of functions performed with location and room numbers where applicable.
  15. Arrange for on-site instruction by various Manufacturers where considered necessary by Consultant, at no additional cost to Owner.
20. Record Documents
1. The general requirements for photographic record of the installation of the Work, as-built drawings, and record drawings are described in Section 018040. Conform to these requirements.
  2. Independently of the Contractor and the documents required by Section 018040, the Electrical Trade Contractor shall obtain and pay for at least 2 sets of black-line white-prints upon which to clearly mark locations and installation of the systems components as work progresses, changes and deviations from conduit and equipment shown so that on completion Owner and Consultant will have records of exact location of these components. Locate exterior buried work by dimension from building including final top and invert elevations. Submit as-built drawings to the Contractor for inspection and acceptance prior to creating record drawings of the building systems, and prior to application for substantial completion.
  3. The Contractor shall ensure that as-built information is accurately recorded and shall check same as the work progresses. As-Built drawings shall be reviewed with Consultant at each job-site meeting.
  4. Record Documents shall include the following information in addition to requirements set out elsewhere:
    1. Inverts of all services entering and leaving the building.
    2. Dimensions of underground services in relation to the building.
    3. Elevations of underground services in relation to ground floor level of the building.
    4. Location of all services embedded in the structure, utilizing references to existing structure.
    5. Dimensioned locations of all services left for future work.
    6. All changes to the Work due to Change Orders and Site Instructions.
    7. All changes to the Work during construction.
    8. All changes to architectural elements that affect the backgrounds of this record set.
    9. Locations of all electrically supervised valves, flow switches and pressure switches.
    10. Location and designation of all items requiring access or service in a hidden location.
    11. Location of all access doors provided for the Electrical Part of the Work.
    12. All changes and revisions to specifications, details and equipment schedules.
    13. All home-run conduits, junction boxes for complete electrical systems.
  5. Upon completion of Contract Work, prior to Substantial Performance inspection, and after final review with Consultants, all Trade Contractors shall, in cooperation with the Contractor, neatly transfer recorded information and make final record submission to Consultant as follows:

1. One (1) set of clean, legible prints.
  2. In the form of electronic CAD drawings as set out in Section 018040.
6. Consultants shall review As-Built information provided by Contractor. Contractor and Trade Contractors shall revise drawings to suit any comments until acceptable for submission to Owner.

#### 21. Warranties

1. The Contractor and all Trade Contractors are specifically cautioned that all warranties relating to products and execution shall be in accordance with Section 017080. All warranties shall commence from the date of Substantial Performance of the Work, or the formal acceptance by the Consultant and Owner of the complete building system of which a product or component forms part, regardless of the startup date of such item, whichever is later.
2. The Contractor and all Trade contractors shall collect from their SubContractors and Suppliers all Guarantees/Warranties specified in the Contract Documents, in the form specified, and in addition all standard warranties offered by product manufacturer's whether specified or not. The Contractor and all Trade Contractors are specifically cautioned that the proper provision of warranties is required by the related services noted in Contract Close-out above.
3. The Contractor and each trade contractor assigned responsibility for a Building System shall provide a one year warranty to the Owner for the specific Building System, in accordance with the General Conditions of the Contract, as modified by the Supplementary Conditions.

#### 22. Maintenance Manuals and Materials

1. The general requirements for the organization, formatting, and contents of Maintenance Manuals and the provision of maintenance materials is described in Sections 018050 and 018060 respectively. All Trade Contractors are responsible for collecting completing all submittals, shop drawings, instructions, data, operating instructions, trouble-shooting instructions, parts list, parts diagrams, evidence of all tests, maintenance manuals, valve tags and similar directories, balancing reports, and any other information requested in the Contract Documents, to assist the Contractor in assembling this information in neat manuals. All information must be in interactive PDF format. No scans of documents will be accepted.
2. The Contractor shall be under no obligation to forward monies certified by the Consultant for the progress draw immediately prior to Substantial Completion, or for Substantial Completion, where a Trade Contractor is substantially deficient in the performance of duties related to warranties, manuals, and submittals.
3. Additional Requirements for the Electrical Maintenance Manuals (see also Division 1)
  1. The manuals shall include complete operating instructions, installation, cleaning and lubricating procedures, preventative maintenance procedures etc., for each piece of equipment or system installed under the Electrical Part of the Work. This information, instructions etc., shall be prepared by the individual equipment manufacturer and as supplement by the manufacturer's designer if, and when, necessary.
  2. The manuals shall include a general arrangement of shop drawings, detailed drawings, applicable operating curves, etc. A complete parts list of assemblies and component parts for all equipment shall be provided, and shall include a recommended spare parts list, quantities, etc., showing the manufacturers name, catalogue number and closest supplier.
  3. All data supplied shall be pertinent to the specifics of the equipment installed and shall not be considered acceptable if the data is of a general nature.
  4. Within the period prior to acceptance of the Work, the Owner's personnel shall be instructed in the proper operation and maintenance of the systems and equipment installed. The instruction period shall be of sufficient duration to fully familiarize the

operating personnel with the systems and equipment. The Owner's personnel shall be instructed in all aspects of the systems and equipment being accepted. The Contractor and Trade Contractors shall include all costs for such instruction to the satisfaction of the Owner, without limitation.

### 23. Contract Requirements for Building Systems

#### 1. Definition:

1. *Control.* For clarity, the definition of control is referenced herein, as set out in Section 019010, Building Systems Requirements. In summary, control means a method by which a component of a building system is instructed to perform the operations and functions to fulfil the requirement and intent of the building system. All systems require control as an integral part of the Work. Controls shall have a similar meaning.

There is no Building Monitoring System (BMS) required by the Work, for control of other building systems, or for future integration of building monitoring systems by Owner. In some cases systems may perform monitoring or sensing functions and provide data to the Owner. Such systems are not a BMS. Responsibility for all control requirements resides within particular building systems work. Provide all control at no cost to Owner and do not rely in any way upon equipment features that allow for BMS installation or control.

2. Provide all work and services required to achieve the design intent and standards for detailed design, procedures, products, systems, and execution of the Building System as it can reasonably be inferred from the documents, including its proper and co-ordinated relation to other Systems, at no additional cost to the Owner.
3. Provide all materials, products, work and services required to achieve the design intent and standards for detailed design, procedures, Products, systems, and execution of the Building System as it can reasonably be inferred from the Contract Documents, including its proper and co-ordinated relation to other Systems, at no additional cost to the Owner.
4. Building Systems requirements are further described in Section 019010, together with assignment of responsibility for Building Systems to the Contractor and specific Trade Contractors. Trade Contractors performing work described in this or other Electrical Divisions shall perform all obligations for Building Systems as assigned. All Trade Contractors shall carefully inspect these requirements, and shall incorporate all such requirements into their work, price, and contractual obligations with the Contractor.
5. The Contractor and trade Contractors are specifically cautioned that the contract requires detailed design, layout, and co-ordination services to ensure that the performance intent of the design prepared by the Consultant is achieved in the finished Work for each and all Building Systems. This requirement has monetary value as part of the Contract Amount. Failure to perform this requirement shall result in a reduction of the contract amount as found by the Consultant, regardless of the performance of other required aspects of the Contract.
6. Drawings for Building Systems are schematic diagrams only, and do not govern the amount of work, product, or material required to achieve conformance with Contract requirements.

**END OF SECTION**

## 1. GENERAL

### 1. General Instructions

1. Comply with the requirements of Section 260500, as if repeated herein.
2. This Section specifies products, common criteria and characteristics, and methods and execution that are common to one or more aspects of the Electrical Specifications. It is intended as a supplement, and is to be read accordingly.

### 2. Building System Requirements and Sequences of Operation

1. Provide all materials, products, work and services required to achieve the design intent and standards for detailed design, procedures, Products, systems, and execution of the Building System as it can reasonably be inferred from the Contract Documents, including its proper and co-ordinated relation to other Systems, at no additional cost to the Owner.
2. Comply with the requirements of Section 260500 and Section 019010, and requirements set out for particular Building Systems in the Specification.
3. The Contractor and all Trade Contractors are specifically cautioned that the Contract requires work and services to achieve the performance and intent of the Building Systems identified in Division 1 of the Specification, including but not limited to emergency egress systems, fire separation systems, barrier free access systems, and other systems that are created by the finished Work.

### 3. Electrical Service and Site Electrical Work

1. The electrical service is existing to remain unless shown otherwise on drawings.
2. No site electrical work is anticipated in this Contract unless shown on drawings.

### 4. System Coordination and Short Circuit Study

1. Not required this project

### 5. Arc Flash Protection

1. Not required this project

### 6. Testing and Commissioning of Systems

1. Provide all materials, products, work and services required to balance, test, and adjust Building Systems to achieve specified performance, at no additional cost to the Owner.
2. Commissioning requirements are described in Section 260500 and Division 1 of this specification, as well as in particular sections for each Building System.

## 2. PRODUCTS AND EXECUTION

### 1. General Materials and Products

1. Materials for this Contract shall be of high quality of their respective kinds and of uniform pattern throughout, in accordance with the requirements of Section 016010 and as further specified or noted for specific materials and products.
2. Install all materials and products to Consultants acceptance and requirements of Section 017010 and as further specified or noted for specific materials and products.

3. Install all materials and products parallel to building lines, whether exposed in the finished Work or not. Obtain clarification and acceptance of proposed routing of systems from Consultant. Do not proceed in uncertainty. Do not feed devices in walls by wiring horizontally from one to the other more than 1m. Feed each device vertically from accessible ceiling spaces to allow for Owner renovation and new openings without interference from electrical distribution.
  4. Electrical materials shall be C.S.A. approved and be so labelled. Material not C.S.A. approved shall receive acceptance for installation by Ontario Hydro Special Inspections Branch before delivery, and modifications and charges required for such acceptance shall be included in work described in this section. Material shall not be installed or connected to the source of electrical power until acceptance is obtained.
  5. Acceptance of products installed presumes that products have not been damaged or exposed to conditions that would adversely affect performance and life expectancy. If in the opinion of the Consultant, materials or Products have sustained damage, or have been exposed to abnormal conditions it shall be the responsibility of the Trade Contractor supplying such materials or Products to have independent tests performed as deemed necessary by the Consultant to establish condition and their acceptability for incorporation into the Work.
  6. Products shall be designed and manufactured in accordance with latest issue of applicable Standards or Authorities when such are either mentioned herein, in Division 1, in Section 260500, or have jurisdiction over such materials or items of equipment. Confirm capacity, ratings and characteristics of products being provided to supply power to equipment provided under other Sections of the Work. Resolve discrepancies before such items are ordered.
2. Excavation and Backfilling – N/A this project
  3. Penetrations of Environmental Separation System, Structural Members, Cutting and Patching
    1. All roof and exterior enclosure penetration work, including holing and sleeving of foundations shall conform to the requirements described in Division 7 as if repeated herein.
    2. In general, the Trade Contractor responsible for the item penetrating the assembly shall supply the appropriate stack, cone, sleeve, or flashing to a size to suit. The Contractor and the Trade Contractor shall co-ordinate the size and location of all such items, taking due regard for required clearances among the various elements and requirements for insulation surrounding the element and its connection to the Environmental Separation System components. The Roofing Trade Contractor shall install such items as an integral part of the roofing work. The Electrical Trade Contractor shall engage and pay the Roofing Trade Contractor for building in, and for any cutting and patching of the roof to suit the electrical requirements. For wall and foundation penetrations of the Exterior Envelope System, the Electrical Trade Contractor shall engage and pay the Contractor for the installation of the items unless other arrangements have been formally accepted during the bidding period.
    3. The Electrical Trade Contractor shall make contractual arrangements and pay for holing to deck, foundation walls, and other assemblies, to allow the passage of his portion of the Work. Requirements for cutting and patching are further described in Division 1.
    4. Notwithstanding any payment arrangements, the Electrical Trade Contractor may not install components that are to be built in, or cut and patched, to the Environmental Separation System, or to structural members including hollow core precast concrete. Such work must be performed by the Trade Contractor or Contractor responsible for the performance of the Environmental Separation System, or the installer of the structural component.
    5. Where drawings detail typical penetrations, supply the items in accordance with such details, as modified to suit particular penetration sizes and configurations.
    6. Where conduit or other items pass through roof, supply Thaler insulated "Stack Jacks" spun aluminium flashings and telescopic cap, or equivalent by accepted manufacturer.

4. Vibration Isolation Requirements

1. Ensure that the vibration induced by electrical Building Systems and their components does not result in any sound level in excess of the levels as defined in the ASHRAE Guide and Data Book, and does not result in physical discomfort to the occupants as solely determined by the Owner.

5. Painting and Identification Marking

1. All non-factory painting and applied finish coatings, whether site or shop applied, shall conform to the requirements described in Division 9 as if repeated herein, and additionally as described herein.
2. In general, all operating devices and equipment shall be supplied with factory-applied finish coatings as installed and warranted by the manufacturer. Choice of colour shall be by Consultant from standard offered ranges of colour from the manufacturer.
3. Supply all equipment and materials fabricated from iron or steel (except conduit and related boxes of galvanized finish) prime painted at factory before shipment. Minimum quality of primer, wherever installed, shall be as described in Division 9 for the specific material noted. If primer is damaged or the unit requires alteration for holing in shop or site, the Trade Contractor shall touch up with primers to match factory-priming and leave ready for painting. All auxiliary support steel described in the Electrical Divisions shall be supplied as described in Division 5 for Miscellaneous Metals, together with prime finishes identified therein.
4. Where not factory-finished by a manufacturer, all metal parts, miscellaneous metal items and work installed exterior to building must be degreased and prime painted unless G90 or Z275 galvanized. Wipe-coat galvanizing or standard galvanizing is not acceptable except where such item is scheduled in the Contract Documents to receive site finish priming and painting.
5. Finish painting of bare conduit, accessories, and unfinished surfaces of equipment is described in Division 9 and as otherwise noted in the Electrical Divisions. Where items are noted for field finishes, leave work in clean, paintable condition to the acceptance of the Painting Trade Contractor.
6. Exposed conduit will be painted in Owner's standard colours where exposed in the finished work to areas scheduled for architectural finish unless otherwise required by Code or Bylaw. Fire alarm junction boxes shall be painted red to unexposed areas and all areas not scheduled for architectural finishes, and this painting shall be by the Electrical Trade Contractor and shall be performed in accordance with the field painting requirements described in Division 9. Co-ordinate painting and identification markings so markings are coloured for clear visibility.
7. Identification markings and coding are described in the Electrical Divisions, and shall be performed by the Trade Contractor responsible for the Building System to which such markings and coding applies. Install markings and coding after acceptance of finishes, to locations required by specification and to facilitate identification of systems in accordance with requirements of authorities having jurisdiction and this specification, including to concealed spaces. Co-ordinate the timing of application of such markings to suit progress of the Work.
8. Identify outlet boxes on the reverse side of box cover with: circuits contained in the box, the panels from which they are fed, the voltage and purpose of the outlet.

6. Welding and Hot Work

1. In every case of welding or hot work temporary protection and fire protection shall be designed and provided by the Trade Contractor performing the welding or hot work in accordance with Division 1 requirements and as necessary to eliminate the risk of fire hazard from such operations. Notwithstanding the responsibility for temporary protection that remains solely with the Contractor, every field welding operation required by the Work includes a written report assessment submitted by the Trade Contractor and Contractor that identifies the

potential fire risks and potentially flammable or combustible materials at and adjacent to the proposed location of the work, or that may be affected by the welding or hot work. The assessment shall detail the methods by which the potential fire risks are to be eliminated. Operations shall be in accordance with the requirements of the reference information and existing conditions contained in the Contract General Conditions, Supplementary Conditions, and Existing Conditions documentation.

7. Bases, Supports, and Fasteners

1. All bases, supports & fasteners shall conform to the requirements of Div. 1 as if repeated herein.
2. In general the Trade Contractor installing a device, product, component, or material shall design and provide all fastenings, brackets, supports, bases, stands and platforms necessary for their installation to meet the requirements and performance noted in Division 1 and reference material, taking into account the characteristics of the component and the Building Systems of which it forms part, the recommendations of the component manufacturer for the specific installation location, and all existing conditions and conditions of service life.
3. This Contract requires the design and provision of all securement, anchorage and other fastenings necessary for the installation of the Work, using good practice and principles for such design identified in Division 1. Design of fastenings shall assume 50% failure of fasteners in each load transfer condition (compression, tension, and shear). By way of illustration, for a bracket with fastening plate subject to tension in top fasteners, compression in bottom fasteners, and shear transfer in all fasteners, such bracket must be fastened with a minimum of two top fasteners and two bottom fasteners each capable of fully accepting the imposed design load to allow for failure of one of the fasteners in each condition.
4. Construct concrete housekeeping bases at least 4" (100 mm) high (or as otherwise noted), of minimum 32 MPa air-entrained concrete with non-slip trowel swirl finish in compliance with requirements for concrete work described in Division 3 to support of floor mounted equipment of any kind, except where specifically noted in the Contract Documents that such bases are not required. Size bases 2" (50 mm) larger than base of apparatus with outside corners chamfered 1.5" (38 mm). Grout motors and equipment to their bases to acceptance of Consultant.
5. All supports and fasteners shall be designed to minimize vibration transfer from operation of systems and anticipated conditions of service life.
6. Design and install supports so that system components can be adjusted after initial erection to achieve tolerances, be true in respect of alignment and grade, and allow controlled movement in accordance with Division 1 requirements for quality and to optimize the performance of the system in the conditions of anticipated service life. Provide such adjustments to optimize the installation immediately upon acceptance of tests during system rough-in.
7. Responsibility for the design and provision of supports and fasteners rests with the Trade Contractor installing the Building System that requires such support, until the forces imposed by the system components are correctly transferred to components of the building structural system at locations capable of accepting such transfer. The Building System Trade Contractor is responsible for evaluation of the structural Building System components and shall propose in writing the forces and locations of such proposed transfer, for acceptance by the Consultant. In general, the structural Building System is composed of load-bearing concrete and masonry assemblies, structural steel, load-bearing studs and framing, and structural steel deck. Such components are identified on the structural drawings. The Trade Contractor may not transfer forces to structural steel roof deck, or elements not shown on structural drawings such as non-load-bearing masonry and framed partitions, suspended ceilings, and other similar items of the Work or existing conditions without the written acceptance of the Consultant, and only then for conduit, minor, and "end of system" devices of the Building Systems with flexible connections, such as luminaires weighing less than 42 lb. (20 kg.)
8. Use of explosive- or percussion-type fastenings of any kind shall not be used without prior acceptance in writing from the Consultant.

## 8. Hangers & Structural Framing Support

1. Hangers and structural framing supports are forms of support that are required by this Contract and shall be provided in accordance with the following particular requirements as well as the general requirements for supports and fasteners noted above.

The Contract requires that each Building System Trade Contractor shall design and provide all systems of hangers, raceway, and wiring channel to support unburied lengths of conduit, equipment, and any other components of the Building System for which the Trade Contractor is responsible. Obtain acceptance of methods of hanging and structural support to building before proceeding. Submit to the Consultant a proposed support method for all components of the Building System. Ensure that imposed design loads on the building structural system do not exceed maximum services loading shown in the Documents or as allowed by Consultant acceptance. Take special care to avoid introduction of undue reaction forces, sound transfer, movement and vibration into structure of building, from motors, transformers, or other equipment.

2. Structural framing support shall be by Allstrut or Unistrut and shall incorporate all accessories required to accommodate conduit and raceway support as specified herein. Size members, rod, and anchorage in strict accordance with manufacturer's design tables, to support anticipated loadings. Allow 20% further loading on supports where space is left for Owner's subsequent additional use.
3. Support conduit in accordance with most stringent requirement of Ontario Electrical Safety Code, other regulations, or this specification.
4. Where conduit is grouped, locate support spacing by smallest size conduit.
5. Provide separation material and effective barrier to ensure no contact between incompatible materials in other portions of the Work or existing conditions.
6. Support hangers with threaded mild steel hanger rods sized in accordance with hanger manufacturer's tables. Design and provide fastening to building structure by embedment of purpose-made male-female lag screw thread adaptors into wood construction, by inserts into concrete, by beam clamps on to structural steel work, or by bolts or welding, all in accordance with support and fastener requirements described in this Section. For equipment support, only where inserts are incorrectly cast-in may surface-fastened anchors be used.
7. Support equipment on load-bearing walls with anchors designed and sized to suit conditions. Fastening to load-bearing stud assemblies will only be permitted where fasteners impose loads directly to studs, and not to intervening wall surface components.
8. Where structural bearings do not exist in the structural Building System or existing conditions, provide miscellaneous steel angle or channel of sufficient size from other structural bearings to support hangers or equipment. Design and provide this support in accordance with Division 5 requirements for miscellaneous metals. The Contractor and Trade Contractor are cautioned that such miscellaneous metals are not shown on drawings of any kind, but are required by the Contract.
9. Plastic cable tie, wire, chain, strap or extension bar hangers are not acceptable for conduit or armoured cable installation under any circumstance.
10. Hangers shall be arranged so as to load structural steel in a concentric manner. Loads to be imparted on joists shall be imposed within 6" (150 mm) of panel joints, to top chord of steel joists only.
11. Support conduits for at least 6'-6" (2000 mm) from isolated equipment or devices with Burgess Vibro Acoustics or equal "SH" isolators with steel spring having 1" (25 mm) minimum static deflection and series connected elastomer element having static deflection of ¼" (6 mm) underload, or use flexible connections.

12. Support fixtures independently of ceiling suspension systems. Provide additional supports as required, which shall be fastened to building structure steel members, joists, beams, etc., but not metal pan or decking unless the Trade Contractor's proposed detail involves fastening to an appropriate number of deck flutes using Uni-strut or equivalent, and only then when accepted by the Consultant. Material for additional supports and their installation shall comply with requirements of U.L.C. Refer to "List of Equipment and Materials" Vol. 2, and "Supplement" for application to rated assemblies.
  13. Support outlet and junction boxes independently of the conduits running to them. Support suspended fixtures and devices independently of the wiring junction boxes that serves them, unless the device is specifically mounted directly to the box without extension of any kind.
  14. Provide recessed luminaires with support frames, and additionally with plastering frames where set in drywall, plaster, or similar ceilings.
9. Sleeves, Firestopping, and Sealant Work
1. Where system conduits pass through masonry walls or concrete, supply 1.3 mm galvanized steel sleeves to the trade contractor constructing such elements, and locate the sleeve. Size sleeves through fire separated assemblies specifically in accordance with clearances for firestopping designs that are selected and provided by the Firestopping Trade Contractor.
  2. Through exterior waterproofed assemblies use heavy weight cast iron pipes machine cut. Extend sleeves 100 mm (4") above finished floors, and cut flush with underside of floor.
  3. For rectangular duct openings for bus ducts and cable tray use minimum 18 gauge galvanized steel sleeves or provide a removable wood box-out of the required size. Brace sleeves to retain their position and shape during the pouring of concrete and other work.
  4. Sleeves on buried conduit shall be 2" (50 mm) larger all round than conduit and be filled with 2" (50 mm) thick mineral wool insulation by Roxul or equivalent. The Trade Contractor installing the conduit shall caulk full perimeter of joints both interior and exterior with sealants to the requirements described in Division 7.
  5. Firestopping and smoke protection work is described in Division 7. All trade contractors shall co-ordinate and cooperate with the Contractor in the contractual division of the Work so that firestopping is provided by a single manufacturer's ULC and local authorities accepted firestop systems to achieve the requirements of the fire separation systems identified in the Work.
  6. No allowance shall be made for lack of sleeves or firestopping to existing portions of systems, as a reason for not providing such sleeves and firestopping in new work.
  7. The work of this Division includes the provision of firestopping of new penetrations through new fire separations.
  8. Sealant work is described in Division 7: All trade contractors shall co-ordinate and cooperate with the Contractor in the contractual division of the Work so that sealant is provided by a single manufacturer's sealant to achieve the caulking and sealing requirements identified in the Documents, and to properly achieve sealing in existing conditions, regardless that sealant work shall be performed by each Trade Contractor for his portion of the Work (except to penetrations of exterior envelope, which shall be by the responsible Trade Contractor for the envelope). This work includes, but is not limited to, sealing of all holes and openings for system components passing through floors and into shafts to a watertight condition. In firestopped conditions, sealing requirements may be accomplished by the firestopping work upon acceptance by the Consultant.
  9. The Electrical Trade Contractor shall caulk spaces between conduit, cables, raceways, cabletrays with "Cerafibre" 2300 F packing and obtain Authorities approval and Consultant acceptance. Pack and seal both sides of openings with Electrovert "Flameseal" putty, minimum thickness 25 mm (1").

## 10. Access Panels and Doors

1. Each Trade Contractor responsible for a Building System described by the Electrical Divisions shall supply for all required locations, and in a timely manner, a 1/8" (2.8 mm) thick hinged metal access doors with frames suitable for the particular assemblies into which they shall be installed, for all access points in the system. The access doors shall be installed by the Trade Contractor that installs the assembly through which access is required.
2. Number and locations for access are not shown on drawings, and include but are not limited to locations in walls or ceilings to permit access to built in or inaccessible equipment, service points, controls, open raceways that are likely to accommodate future wiring, junction boxes, and components requiring access for inspection or maintenance by applicable regulation or code. Where lift out acoustic panel ceilings are used, access doors are not required but where requested by the Consultant panels shall be secured with accessible hold down clips and marked with Bildemup #6RH brass paper fasteners inserted through boards and bent over. Paint heads with red enamel before installation.
3. Access doors shall be equivalent to Stelpro Ltd. #722 flush type of size to suit ease of access to controls, boxes, or components serviced, minimum size 16" by 12" nominal (400 mm x 300 mm) "Reach in", 16" by 24" nominal (400 mm x 600 mm) "Crawl in", with prime coat finish, concealed hinges, screwdriver lock and plaster key. Access doors in finished masonry or drywall construction shall be #722 less plaster key. Access doors shall be #726 in acoustic tile ceilings; #704 in drywall ceiling and #726E in plaster ceilings.
4. Access doors in fire rated ceiling assemblies, all fire rated walls, duct shafts or in corridor walls shall be UL, ULC or WHI listed 1 1/2 hour fire rated access doors equivalent to LeHage #L1010, Nailor Hart #0900 or Acudor #150B with screwdriver lock.
5. Acceptable Manufacturers:
  1. Smille, McAdams & Summerlin Ltd.
  2. Mifab (Modular Equipment Mfg. Inc.)
  3. Can Aqua Inc.
  4. Acudor Products Ltd.
  5. LeHage (Ancon Industries Ltd.)
  6. Nailor Hart Industries Inc.
6. Upon award of Contract, Trade Contractors and the Contractor shall co-operate to select a single manufacturer for access doors throughout the Work, for consistent appearance.
7. Provide the appropriate Trade Contractor with all pertinent information for installation. Ensure that all panels and doors are flush mounted and properly aligned with building modules and grids. Indicate locations on record drawings.
8. The work shall be laid out and installed to maximize the location of junction boxes within common corridors and spaces, and to areas of the Facility served by open ceilings or lay-in panel ceilings. Minimize requirements for junction boxes and access to areas of wallboard ceilings and walls or other ceilings or walls so that the need for access doors and panels is eliminated wherever possible.

## 11. Raceways and Fittings

1. Drawings do not show all raceways. Those shown are generally in diagrammatic form only.
2. Conform with the recommendations and requirements of the latest editions of the following:
  1. CAN/CSA C22.2 No. 18, Outlet Boxes, Conduit Boxes, Fittings and Associated Hardware.
  2. CSA C22.2 No. 45, Rigid Metal Conduit.
  3. CSA C22.2 No. 56, Flexible Metal Conduit and Liquid-Tight Flexible Metal Conduit.
  4. CSA C22.2 No. 62, Surface Raceways and Lighting Fixture Raceways and Fittings.

5. CSA C22.2 No. 83, Electrical Metallic Tubing.
6. CSA C22.2 No. 126, Cable Tray System.
7. CSA C22.2 No. 211.2, Rigid PVC (Unplasticized) Conduit.
8. CAN/CSA C22.2 No. 227.3, Flexible Non-metallic Tubing.
9. CSA C22 No. 18, Outlet Boxes, Conduits Boxes, Fittings and Associated Hardware.

#### Conduit Work

1. Wire and cable shall be installed in conduit throughout the Work, except in limited circumstances as stated in this specification, using conduit with approved fittings as follows herein. Provide bushings on the ends of all conduits in enclosure, boxes, panels and cabinets, to protect the conductor installation. Except where grounding bushings are specified use all plastic insulated bushings temperature rating 150°C with double locknuts. .10 Install all locknuts and bushings to ensure a secure mechanical and electrical bond. Use Erickson couplings in lieu of running threads.

Bx may be used from junction box to luminaire where junction box is located in accessible ceiling and run to luminaire is less than 10' (3 m).

Bx may be used to feed power outlets in partitions from locations in accessible ceilings where run of Bx within ceiling space does not exceed 15 feet (4.5 m) provided that installation of Bx is fastened to support at not more than 1 m intervals.

2. Rigid galvanized steel conduit shall have threaded IPS fittings, of steel or malleable iron. Threadless, die cast or pressure cast fittings are not acceptable. Rigid steel conduit shall be used:
  1. Where noted and required by regulations
  2. For all conduit work exposed in the finished Work
  3. To all hazardous areas
  4. On the exterior of building
  5. Where system may be exposed to mechanical damage
  6. Where conduits turn up or turn down out of concrete slab
  7. At all potentially damp and wet locations.
3. Conduit embedded in concrete or buried below grade floors shall be CSA approved rigid PVC type. Do not embed conduit in concrete slabs-on-grade unless it is impossible to provide required electrical services in any other manner. Obtain Consultant's approval for any such embedment. Where expressly permitted in such slabs, use rigid thick wall p.v.c. conduit with fittings. Such conduit shall not be used for exit light, emergency light, emergency power, or fire alarm systems or components. Otherwise, subject to required uses of rigid conduit and EMT, such conduit may be used:
  1. In slabs with rigid steel galvanized turn-up;
  2. Underground with rigid steel galvanized turn-up; and
  3. In concrete walls.
4. In areas where conduit will be exposed to corrosive atmospheres, use rigid P.V.C. or approved equal conduit and fittings only after discussion and acceptance by Consultant, saving only areas where this is not permitted by Code.
5. Steel galvanized electrical metallic tubing (EMT) may be used in place of rigid conduit in dry locations subject to governing regulations, embedded in masonry walls, and concealed above suspended ceilings. Connectors shall be provided with factory installed insulated throats. For EMT use steel concrete tight set screw fittings as manufactured by T & B or equal. Die cast or pressure cast fittings are not acceptable Within service rooms conduit may be surface-mounted. Subject to requirements for use of other conduit, EMT may be used:
  1. In partitions;
  2. In ceiling spaces;
  3. In service spaces.

4. In masonry walls
5. In all exposed installations where not subject to mechanical damage.
6. Use flexible metallic conduit for connections to chain suspended and recessed fixture drops, motors and similar equipment where necessary to prevent transmission of vibration. A code gauge green grounding conductor shall be provided for all such connections. Use "Sealtite" conduit with Hubbell Kellum Sealtite conduit strain relief grips for all connections at motors and noise generating equipment. Such use is restricted to:
  1. luminaires and device final drops to fixtures located in suspended lay-in-panel ceilings;
  2. Locations requiring vibration isolation;
  3. Flexible armoured conduits shall be limited to 10'-0" lengths where run horizontally from take-off junction boxes, and shall be minimum 600 mm at motors and noise generating equipment.
7. Fasten every conduit and cable to structure by means of accepted conduit clamps or clips. Wire lashing is not acceptable.
8. Conceal conduits and wiring except where noted. Run exposed conduits parallel to building lines and to other conduits. Provide every empty conduit with a pull rope and identify to designate its function (Power, Telephone, Fire Alarm and the like).
9. Where conduit is installed in concrete slabs, obtain general acceptance, prior to commencing the work, on both maximum dimension and cross overs which may be used therein.
10. Install conduits in such a manner as to conserve head room and interfere as little as possible with free use of space through which they pass. Obtain acceptance for routing of same. Keep conduits at least 150 mm clear of high temperature work.
11. Conduit installed at the roof level of exposed structures, shall be run tight to roof deck, above purlins and beams.
12. Conduit and cables for electrical work in demountable type and drywall type partitions shall enter from above, from a junction box concealed in the ceiling above and shall comprise a flexible conduit connection.
13. All branch wiring shall be provided with a separate code gauge supplementary grounding conductor run in each conduit or duct, terminating at ground block at panelboards.
14. Run conduit exposed in mechanical equipment rooms and areas, electrical rooms and areas, fan rooms, and the like, and installed after mechanical and other equipment is completed. Install fixtures, outlets, starters, etc., to clear and to suit application.
15. Runs of communication and control wiring provided under this Contract shall be installed in zone conduit sized for present and future use, from communications and control demarcation points to each ceiling level, and each fire compartment, and as additionally described on Drawings.
16. Further, communications wherever required to cross exposed ceiling areas shall be located in conduit. In general, each Building System shall have its own system of conduit that shall be provided by the Trade Contractor installing such Building System. The exception to this is for empty conduits and boxes to partitions and otherwise as noted on electrical drawings and as required for communication and data device locations shown on drawings, which shall be provided by the Electrical Trade Contractor for the use of other Trade Contractors or the Owner. Further requirements are specified under each Building System.

#### Conduit Materials

1. As indicated in Electrical Specifications on Electrical Drawings.

### Conduit Installation Particulars

1. Where conduit joints occur in concrete, use silicone sealing compound to make water tight.
2. Lay out conduit to drain free of all moisture.
3. Securely hold conduits in place in concrete or masonry during pouring and construction operations; provide templates, forms and spacers as necessary.
4. Support multiple runs of conduit on channel or angle iron with rod hangers.
5. Secure all conduits in place with conduit clamps, T & B or approved equal. Perforated pipe straps, wire lashings, wood screws or nails are not acceptable.
6. Provide conduit expansion joints where conduits cross building expansion joints, also in straight runs of conduit 30 m (100') or longer. Conduit expansion joints shall be telescoping sleeve type, with insulated bushings and ground jumper.
7. Make field bends and offsets uniform and symmetrical without flattening conduit. Minimum bending radius shall be ten (10) times the conduit diameter.
8. Ream conduit ends to remove burrs and sharp edges. Fit conduit stubs with waterproof plastic caps during installation to protect threads and to prevent entrance of moisture into conduit.
9. Test all conduits for clear bore using ball mandrel, brushes and snake. Clear any conduit which rejects the ball mandrel. Replace if necessary. Bear all costs involved in making all work good, restoring all surfaces to original condition.
10. Install a continuous nylon cord 180 kg (400 lb) test in each conduit left empty.
11. Install a copper ground conductor within the flexible conduit at each connection.
12. Provide conduit seals in conduits which pass to the outside.
13. Provide pull boxes, fittings or junction boxes in conduit runs, on the basis of not more than two (2) right angle bends or their equivalent or not more than 30 m (100'), in straight runs between boxes. For outdoor direct buried conduit, up to 50m.
14. Size conduits to code requirements, provide larger sizes where noted.
15. Size conduits for low voltage wiring to manufacturer's recommendations.
16. Provide conduit sealing fittings and correspond for hazardous application to Electrical Safety code requirements.
17. Maximum conduit size permitted in a concrete slab shall be 35 mm. In any case verify with Structural Consultant for acceptability.
18. Where multi-conduits parallel run and/or crossover in concrete slab / wall, verify with Structural Consultant for acceptability.

### Surface Metal Raceway (acceptable only where conduit cannot be used)

1. Provide surface raceway only where other methods of routing cannot be accomplished, and only with permission of Consultant. The surface metal raceway systems shall consist of surface metal raceway, appropriate fittings and device brackets to complete installation.
2. Any surface raceway is to be utilized in dry interior locations only as per ESA.
3. Submit drawings for acceptance showing the complete layout of all products that make up the complete system for each floor prior to installation with raceway lengths, device type (power

and data), locations and circuits identified, complete with data sheets and samples.

4. Any surface raceway system that is allowed because other methods are not possible, for branch circuit wiring and/or data network, voice, video and other low-voltage wiring, shall be Wiremold ALDS 4000 Series with base, cover, associated fittings and joints to suit conditions and device covers, or equivalent by Hubbell. The raceway shall be metal, two-piece design with a base and a snap-on cover. The raceway shall be complete with one integral barrier in the base for power/data separation. Power shall be in top; data in the bottom. Finish to all exposed fittings and raceway shall be anodized satin unless otherwise noted.
5. For individual devices located on surfaces where conduit cannot be recessed provide single or double channel raceway system products.
6. Receptacle / Data plates shall be Wiremold V4047 series, or accepted equivalent by Hubbell.
7. Exposed raceway in finished area (not in service spaces, mechanical/electrical room, ceiling, etc) shall be: Hubbell HBL500 series or Wiremold V700, white finish.
8. Install raceways system complete with appropriate fittings such as connectors, bushings, elbows, couplings, locknuts, expansion fittings, fasteners and supports and accessories supplied as integral parts of assembly, as specified. Installation shall comply with Regulatory Authorities requirements.
9. Neatly install exposed raceway running parallel to and at right angles to building lines and equally spaced in groups.
10. Keep raceway ends parallel and on proper spacing to suit knockouts or raceway openings in equipment or enclosure.
11. Keep raceways at least 150 mm clear of heating pipes, flues and hot item surfaces. Where required clearance cannot be provided, obtain written approval from Consultant to alter layout or to reduce clearance.
12. Provide expansion couplings, with bonding jumper and ground clamps where raceways cross building control joints.
13. Use only metallic, enclosed raceway on installation that required shielding of electrical cables or where installed in ceiling used as return air plenum, as specified or indicated on Drawings.
14. Raceways shall have established positive low resistance paths to ground and effectively isolate conductors so that any short-circuit arc is confined.
15. Select appropriate fittings, such as grounding bushings, bonding and grounding straps, to maintain continuity and effectiveness of grounding of raceway system.
16. Provide necessary fasteners and supports acceptable for type and size of raceways, to ensure rigid, complete assembly.
17. Provide suitable inserts or expansion type machine bolts for fastening raceways, fittings, boxes and equipment to concrete surfaces.
18. Do not use wood screws, lag screws, expansion shields, rawl plugs and nylon inserts.
19. Secure raceway and other associate work to structure members. Raceway shall not be supported from ceiling suspension system.
20. Thoroughly clean raceway and dry clear obstructions before pulling cable or wire.
21. Minimum raceway size: 21mm (3/4").

Outlet and Conduit Boxes

1. Comply with the requirements of latest edition of the followings:
  1. CSA Standard C22.2 No.18, Outlet Boxes, Conduit Boxes and Fittings.
  2. CSA Standard C22.2 No. 85, Rigid PVC Boxes and Fittings.
2. Outlet and conduit boxes - general
  1. Size boxes in accordance with CSA C22.1.
  2. 102mm square or larger outlet boxes as required for special devices.
  3. Gang boxes where wiring devices are grouped.
  4. Blank cover plates for boxes without wiring devices.
  5. 347V outlet boxes for 347V switching devices.
  6. Combination ganged boxes with appropriate steel removable barriers where outlets for more than one system are grouped.
  7. Where standard make boxes are not suitable, provide boxes of special design to fit space and other requirements.
  8. Where vapour proof lighting is specified, provide matching vapour proof ceiling or wall junction boxes and fittings as required.
3. Sheet steel outlet boxes
  1. Electro-galvanized steel single and multi gang flush device boxes for flush installation, minimum size 76 x 50 x 38mm or as indicated. 102mm square outlet boxes when more than one conduit enters one side with extension and plaster rings as required.
  2. Electro-galvanized steel utility boxes for outlets connected to surface-mounted EMT conduit, minimum size 102 x 54 x 48mm.
  3. 102mm square or octagonal outlet boxes complete with steel fixture studs where supporting lighting fixtures. Die cast fittings not permitted.
  4. 102mm square outlet boxes with extension and plaster rings for lush mounting devices in finished plaster or tile walls.
4. Masonry boxes
  1. Electro-galvanized stamped steel masonry single and multi gang boxes for devices flush mounted in exposed block walls, minimum size 95x 50 x 64mm standard and 102 x 57 x 61mm for 347V.
5. Concrete boxes
  1. Electro-galvanized stamped steel concrete type boxes for flush mount in concrete with matching extension and plaster rings as required.
6. Floor boxes for receptacles and telecom outlets
  1. Single or double receptacles and /or telecom outlets: Round type, concrete tight electro-galvanized sheet steel floor boxes complete with side and bottom knock-outs, and with adjustable finishing rings to suit floor finish with brushed aluminum faceplate. Device mounting plate to accommodate short or long ear receptacles. Minimum depth: 28mm for receptacles; 76mm for communication equipment.
  2. Multi receptacles and /or telecom outlets for meeting rooms and open work rooms: Electro-galvanized tamped steel concrete type, combination power / communication, flush mounting complete with modular device plates, side and bottom knockouts, lift-up cast aluminium recessed cover and cable lid, grey epoxy powder finished. Box 356mm (L) x 321mm (W) x 105mm (D).
  3. Legrand RFB9 for casting into concrete and with cover RFB119CTCGY or approved equivalent. Provide all necessary accessories to suit application and carpet insert.

7. Conduit boxes
  1. Cast FS or FD aluminium, or ferrous boxes with factory-threaded hubs and mounting feet for surface wiring of switches and receptacles.
  2. PVC FS or FD boxes or PVC conduit where required in special corrosive areas as indicated on Drawing.
8. Fittings - general
  1. Bushing and connectors with nylon insulated throats.
  2. Knock-out fillers to prevent entry of debris.
  3. Conduit outlet bodies for conduit up to 35mm and pull boxes for larger conduits.
  4. Double locknuts and insulated bushings on sheet metal boxes.
9. Installation
  1. Support boxes independently of connecting conduits.
  2. Fill boxes with paper, sponges or foam or similar approved material to prevent entry of debris during construction. Remove upon completion of work.
  3. For flush installations mount outlets flush with finished wall using plaster rings to permit wall finish to come with 6 mm of opening.
  4. Provide correct size of openings in boxes for conduit, mineral insulated and armoured cable connections. Reducing washer are not allowed.
  5. Size and install appropriate boxes and enclosures in accordance with applicable section(s) of Ontario Electrical Safety Code and manufacturer's recommended procedures.
  6. Co-ordinate location and installation of boxes so as to be accessible and clear from Building System equipment, etc.
  7. Install pull boxes in inconspicuous but accessible locations.
  8. Use pull boxes for conduits larger than 35mm. Use conduit outlet bodies for conduit 35mm.
  9. Provide approved hole plugs in unused conduit knockouts and openings.
  10. Furnish boxes and enclosures with corrosion resistant machine screws.
  11. Boxes and enclosures embedded in concrete for flush mounting, shall be secured properly with connecting conduits and related works set in place before concrete is poured. Forms, when used, shall be able to be removed without disturbing installed boxes or enclosures.
  12. Ensure junction and outlet boxes mounted in ceiling cavities do not interfere with removal of ceiling tiles.
  13. Use masonry boxes for flush mounting in exposed block walls, concrete boxes for flush mounting in concrete wall.
  14. Furnish conduit boxes with neoprene gaskets for outdoor area or hazardous area application.
  15. Install all wall boxes for door security access devices, fire alarm devices, etc., adjacent to lock side of door openings unless otherwise shown. Check door swing before installing any switch.
  16. Install all boxes in walls so that tapped holes for mounting wiring devices or fixtures will be aligned vertically or horizontally, as required. Where boxes are grouped at one location with common and varying mounting heights, align boxes horizontally and vertically from centre line unless otherwise indicated.
  17. Offset outlet boxes in sound attenuating partitions to avoid undue transmission of sound between the partition elements. Use flexible conduit connections where wiring is required between outlet boxes on opposite sides of partition.
  18. Offset outlet boxes where installed on either side of a fire separation.
  19. Where steel supports are required for outlet boxes, wood supports are not acceptable.
  20. Maintain integrity of vapour barriers along building perimeter wall where flush outlet boxes are required.

## 12. Wire and Cable

1. In general, electric power connections and power wiring for equipment in systems described in this and other Divisions shall be supplied and installed by the Electrical Trade Contractor unless specifically noted for installation by the Trade Contractor responsible for the system. See Starter Schedule on Drawings for clarification. The Contract requires complete electric wiring to ensure functional and operational systems. All electrical work must conform to requirements described in Electrical Divisions and be concealed except in service areas. Comply with the requirements of the latest editions of the following:
  1. CSA C22.2 No. 0.3, Test Methods for Electrical Wires and Cables.
  2. CAN/CSA-C22.2 No.131 – Type TECK 90 Cable.
  3. CSA C22.2 No. 38, Thermoset Insulated Wires and Cables.
  4. CSA C22.2 No. 75, Thermoplastic-Insulated Wires and Cables
  5. CSA C22.2 No. 65, Wire Connectors.
2. All wiring for powering of components of a Building System must be in solid conduit or EMT, excepting only where specifically noted for armoured.
  1. Use minimum solid #12 wiring and larger as required for deratings.
  2. #10 AWG wire and larger shall be stranded.
  3. Use RW90 X-Link, 1000V, minus 40 degree, 90°C rated insulation for 250MCM and larger.
  4. Joints in feeder cables are not permitted. Co-ordinate lengths with cable supplier.
  5. For wiring through or in lighting fixtures use type 'GTF' fixture wire, rated 600 volts to meet code requirements for recessed fixtures.
  6. Wires and cables for outdoor locations and feeding items outside of the plane of the building thermal barrier system shall be minus 40°C rated.
  7. Single conductor armoured cables, where required, shall conform to the Electrical Safety Code, Rule 12-108, Bulletin 12-7-11.
  8. BX may be used only in hollow partitions for receptacles, but not more than 3 meters long.
  9. Lighting fixture wiring in accessible ceiling spaces shall be run in conduit from the lighting panel to ceiling outlet boxes with armoured cable drops no longer than 3.0m (10 ft.) permissible from the boxes to fixtures.
  10. Armoured cables, where specifically allowed, shall be complete with interlocked aluminum armour, approved fastening and connectors and meet the requirements of Vertical Flame Test-Cables in Cable Tray of CSA C22.2 No. 0.3. The PVC jacket cables (TECK 90 and ACWU90) shall be FT6 rated.
3. In general, electric control connections and wiring necessary to provide control of components of a Building System, to ensure its complete and integrated function, and to ensure it fulfils each and every requirement of the system sequences of operation and the functions of the component, shall be provided by the Trade Contractor responsible for such system. Conduit for such wiring shall be provided by the Electrical Trade Contractor for all devices of systems that are shown on electrical drawings, whether electrical or for other systems. All other conduit for controls wiring for devices not shown on electrical shall be provided by the trade contractor responsible for the system.
4. All wiring for control of components of a Building System must be in solid conduit or EMT using minimum #18 wire for 24 volt control or less, and minimum #14 wire for 120 volt control and motor control. Use wiremold where wiring cannot be concealed in finished areas, after obtaining acceptance of Consultant in each case.
5. Electrically operated equipment shall be C.S.A. accepted and bear acceptance label. Special Inspection Label acceptable to provincial authority having jurisdiction will be accepted in lieu of C.S.A. acceptance.
6. Provide branch circuit wiring, conduits and feeders to form a complete Electrical Distribution System as required to power equipment and devices of that system, lighting, and auxiliary systems and related systems electrically-powered components. Separate conduit systems shall be provided for feeder, lighting and power systems and auxiliary communication systems.

7. Wire and cable shall comprise copper conductors, sized as noted, rated 75 deg. C., 600 volt minimum flame retardant insulation, and CSA approved for application. Use of aluminum shall only be allowed for electrical service work from utility system to building electrical system only where specifically noted on drawings for aluminum.
8. Wire and cable installed in conduit shall be PVC insulated Type TWH Flame retardant and comply with CSA Specification C22.2 No. 75.
9. Use Electrovert "Z Type" code markers for control & communication conductors, regardless of what Trade Contractor provides the wiring.
10. Minimum wire size for power wiring shall be No. 12 AWG gauge unless specifically noted otherwise for select applications of wiring, or where runs exceed 27 metres (90') which shall be minimum No. 10.
11. All power wiring to equipment and devices shall be in conduit unless specifically noted otherwise for select applications of wiring. 'Bx' wiring may be used for final portions of runs from junction boxes for the power wiring of fixtures and devices that are suspended (other than suspended using steel conduit) or that are located in suspended assemblies or assemblies subject to movement.
12. Wiring between sensors and controls units, regardless of what Trade Contractor provides the wiring, shall be Class II, 18-24 AWG, red insulation, stranded U.L. Classified, PVC insulated or TEFLON jacketed cable suitable for use in plenums, where applicable.
13. Wiring for communications systems shall be strictly in accordance with the detailed specifications for each system, and to meet the written recommendations of the manufacturers of each system component.
14. Wire and cable shall not be installed at site condition temperatures below 20°C unless "-40" type is used. Wiring to heating equipment shall be rated 90°C minimum, the ampacity of which shall be limited to 75°C value. Wiring for exterior locations in the finished Work shall be type 'U', -40°C rated.
15. Conductors used for all auxiliary systems (e.g. Fire Alarm) shall be tagged and/or colour coded by Trade Contractor installing such wiring, and where applicable shall agree with manufacturer's wiring diagrams.
16. Maximum voltage drop between furthest outlet of any circuit, when fully energized, and panel to which it is connected shall not exceed two percent except for electric heating circuits that shall not exceed one percent. Determination shall be by Trade Contractor installing such circuit, to the approval of authorities and acceptance of the Consultant.
17. All circuits shall contain separate phase, neutral and ground conductors. Common neutral configuration shall not be permitted.
18. Cables shall be terminated with moisture proof connectors, clamped to sheet metal enclosure by a single non ferrous locknut and grounding bushing.
19. Sheaths of multi conductor cables shall be grounded at both cable ends.
20. Sheaths of single conductor cables shall be grounded at supply end only. Provide a Code Gauge Grounding Conductor with each feeder cable run.
21. Number of wires indicated for lighting and power, motor and motor control, alarm, signal, communications, and auxiliary systems is intended to show general scheme only. The required number and types of wires shall be installed in accordance with equipment manufacturer's diagrams and requirements, and with requirements of the installation, except that specification standards shall not be reduced.

22. Solderless connectors with nylon jacketed "Vibration proof" screw on wire connectors ideal "Wing Nuts", rated 600 volts shall be used for joints in Branch Wiring.
  23. Use compression joints and terminals for all control wiring; and all conductors #4 AWG and larger. Mechanical connections are acceptable at panelboards and circuit breakers where these are part of factory assembly.
  24. Wire or cables in feeders, sub feeders and branch circuits shall be colour coded in accordance with Ontario Electrical Safety Code. Each end of feeder terminations (e.g. in Switchboard, Panelboards, switches, splitters and the like) Code Phase A - Red, Phase B - Black, Phase C - Blue, Neutral - White.
  25. Include in each conduit, tubing and raceway, a code gauge green supplementary grounding conductor which shall be connected to suitable ground bus in equipment.
  26. Armoured or sheathed cables may be used only for vertical wiring within demountable and dry wall type partitions and above drywall ceilings as fixture whip between junction box and fixture only; however it shall not be directly buried in or below concrete slabs.
  27. The use of exposed plastic jacketed cables shall be subject to Contract Change Order and approval of local inspection Authorities, but shall not be installed in ceiling spaces used as return air plenums for mechanical air handling systems. The Work shall only include such wiring for electrical distribution and power purposes upon review and acceptance of a proposed substitution by the Owner, with credit to the Contract Price. Do not bid the Work with expectation of acceptance of any plastic-jacketed wiring except where specifically set out in the Documents.
  28. For underground wiring use conductors with RWU type insulation.
  29. Use an approved lubricant to assist in pulling conductors through conduit. Neatly train and lace wiring inside boxes, equipment and panelboards.
  30. Balance the loading on feeders so that unbalanced load is less than 10%.
  31. Protect all exposed non-armoured cables in manholes, pull pits and trenches with an approved fire protective fibreglass tape of '3M' manufacture or approved equal. Extend the protective wrapping on the cables where they leave pull pits or trenches below switchgear to the circuit breaker or fused switch terminals. Rack cables in manholes and pull pits to provide clear access for maintenance and servicing.
13. Devices
1. Wiring devices unless otherwise specified herein, or noted, shall be as manufactured by Pass & Seymour, with acceptable alternatives by Hubbell, or Leviton. All devices shall be of one manufacturer throughout.
  2. The following are minimum standards. Additional specification requirements and selection of devices are described on drawings, in schedules, and in applicable specification sections for each Building System.
  3. Provide each device with an outlet box of suitable dimensions and a faceplate. Device boxes shall be adapted to their respective locations.
  4. Comply with the requirements of the latest editions of the following:
    1. CSA-C22.2 No.42, General Use Receptacles, Attachment Plugs and Similar Wiring Devices.
    2. CSA-C22.2 No.42.1, Cover Plates for Flush-Mounted Wiring Devices.
    3. CSA-C22.2 No.55, Special Use Switches.

4. CSA-C22.2 No.111, General-Use Snap Switches.
5. CSA-C22.2 No. 144, Ground Fault Circuit Interrupters.
5. All exposed devices and cover plates shall be white finish unless noted otherwise.
6. Switches, Occupancy & Daylighting Control Sensors, Receptacles and Other Similar Devices
  1. Refer to Electrical Specifications on Electrical Drawings.
7. Device Installation, Mounting Heights and Locations
  1. As Set out in Electrical Specifications on Drawings; and as described herein.
  2. Mounting heights are from finished floor level to centre line of device outlet, unless noted otherwise. Confirm all locations before installation. In all areas accessible to persons in wheelchairs, the mounting heights of all switches, thermostats, intercom switches, pull stations, etc. shall comply with OBC Code requirements.
  3. The mounting heights of all power and lighting devices shall comply with Ontario Electrical Safety Code requirements and Barrier Free requirements of the Ontario Building Code. The mounting heights of all fire alarm devices shall comply with CAN/ULC requirements.
  4. If mounting height of equipment is not specified or indicated, verify before proceeding.
  5. Approximate locations of electrical equipment, fixtures switches, outlets, and the like are given on the drawings. In absence of definite detail exact location of outlets shall be determined on site as work progresses.
  6. The right is reserved to alter the location of devices a distance of up to 10' (3 metres) without involving a change to the Contract amount, providing notice is given prior to installation.
  7. Switch and receptacle boxes and similar penetrating elements of assemblies shall not be installed "Back to Back". Separate by a minimum of 6" (150 mm), except in stud supported assemblies separate by a minimum of one stud space, to minimize sound transmission.
  8. Dimmers and other devices requiring or subject to heat loss shall be mounted in individual boxes. Do not gang such devices.
  9. Local switches for lighting shall be installed on the lock side of doors.
  10. Device plates shall cover opening left for outlet box, and plates shall be attached to boxes in an accepted manner. Outlets and fixtures are to be located symmetrically, (i.e. centred in wall panels, ceiling panels or tiles, columns, between and above doors and the like).
  11. Install single throw switches with handle in "UP" position when switch closed.
  12. Install devices in gang type outlet box when more than one switch is required in one location. When supplied from different voltages or power sources, provide metal barriers in the box.
  13. Clean debris from outlet boxes.
  14. Install devices plumb and level.
  15. Adjust devices and wall plates to be flush and level.
  16. Clean exposed surfaces to remove splatters and restore finish.

17. Test each device for proper polarity and proper operation.

#### 14. System Component Identification

1. Identify electrical equipment described in the Electrical Divisions with 3 mm thick black laminated plastic nameplate to indicate equipment controlled to provide instruction or warning. Fasten each plate with two chrome-plated screws. Lettering shall be 6 mm high for small devices such as control stations and at least 13 mm high for all other equipment.
2. Provide panelboards with typewritten schedules identifying outlets and equipment controlled by each branch circuit including existing panels being changed. Protect schedules with non-flammable clear plastic.
3. Identify junction boxes, pull boxes, cover plates, conduits and the like, provided for future extension, indicating their function (e.g. power, fire alarm, communication).
4. Verify Owner's room names and numbers prior to listing on nameplates and schedules.
5. Identify conduits and cables for the various systems by the use of the following distinctive coloured labels. The Labels shall comprise pressure sensitive plastic tape with printing labels indicating the system. Apply a small area of paint to the outside and inside of each outlet box, pull box and panel as it is being installed. Identify junction boxes in suspended ceiling areas with colour on both inside and outside.
  1. 120/208 volt system – yellow
  2. Fire alarm systems – red
  3. Data cabling system – blue
  4. Security/Intercom/CCTV systems – black
  5. Other telecommunication systems – green
6. Locate identification labels at follows:
  1. Behind each access.
  2. At each change of direction, at junction boxes, and at both ends of each run.
  3. At not more than 15m apart in straight runs.
  4. Where passing through a wall, partition & floor. 1 on each side of wall, partition, & floor.
7. In addition, each box shall be identified with a system and service designator of logic reference to the service.

#### 15. Cable and Conduit Labels

1. For power and lighting system feeders, install labels at either end of the conductors where terminated inside of equipment to match wiring diagram conductor identification or panelboard circuit numbers. Typical identification Panel AA circuit - 21; use "AA-21". For a three phase circuit provide identification on phase A conductor only. For a single phase circuit provide identification on the phase conductor.
2. For lighting branch circuits identify circuit at panel and in outlet box connection to lighting fixture. Install label on phase conductor tap-off. Typical identification if fixture connected to Panel A, circuit 5; marker identification A-5.
3. For branch circuits supplying single phase and three phase devices such as receptacles and connections to equipment identify conductors at panel and in device outlet box. Install label on phase conductor inside outlet box. Typical identification if device is connected to Panel B - circuit 14, marker identification "B-14".
4. For switchboards identify all control conductors at terminal strips inside equipment and where terminated at all remote devices. Identification shall match numbering system on Drawings and "Reviewed" shop drawings.

5. Identify all fire alarm systems conductors at terminal strips located in:
  1. Control panels.
  2. Annunciators.
  3. Printers.
  4. Local terminal cabinets.
  5. All remote devices.
  6. All connections in the system.
  7. Identify in accordance with the numbering system on the accepted shop drawings.
6. For miscellaneous systems identify all conductors at terminal strips located in:
  1. Control and/or monitoring panels.
  2. Control and/or monitoring stations.
  3. Local terminal cabinets.
  4. All remote devices.
  5. All connections in the system.
  6. Identify in accordance with the numbering system on the accepted shop drawings.
7. Equipment Nameplates
  1. Provide lamacoid name plates, black background with white engraved letters 0.4" (10 mm) high, for electrical equipment but not limited to panels, switchboards, transformers, disconnect switches, breakers, contactors, relay panels, starters, TVSS, UPS, FACP and miscellaneous panels.
  2. Nameplates shall indicate voltage, capacity, upstream, and downstream equipment Typical identification for panel: "Lighting Panel C, 120/208v, 3p, 4w. Supplied from Panel BB".
  3. Install plates after all painting has been completed. Secure with mechanical fastening devices except on the inside of panel doors where gluing will be acceptable.
9. Power system colour code
  1. Power system phase colour code:
    1. Red - Phase A
    2. Black - Phase B
    3. Neutral - White
    4. Ground - Green.
  2. Identify incoming utility service lines with enamel paint to above colour code.
  3. Band buses in switchboard and panels to above colour code.
  4. Provide branch conductors to above colour code.
10. Manufacturer's Nameplates
  1. Have the manufacturer's nameplates affixed to each item of all equipment showing the size, name of equipment, serial number and all information usually provided, including voltage, cycle, phase, horsepower, etc., and the name of the manufacturer and his address. Ensure that all stamped, etched or engraved lettering on plates is perfectly legible. Ensure that nameplates are not painted over. Where apparatus is to be concealed, attach the nameplate in an approved location on the equipment support or frame.
  2. Ensure that panels and other apparatus which have exposed faces in finished areas do not have any visible trade marks or other identifying symbols. Mount nameplates behind doors.

11. Signage: Provide signage to local inspection authority on all equipment and electrical rooms. The suitable warning signs must be installed as per Electrical Safety Code.
16. Junction Boxes, Pull Boxes and Cabinets Accessories
  1. "Thruwall" and "Utility" type boxes shall not be used.
  2. Electrical boxes and panels shall be CSA approved, code gauge sheet metal, galvanized or with suitable protective treatment. Secure covers with screws or bolts.
  3. Sheet metal enclosure, welded corners and formed hinged cover suitable for locking in closed position. Covers with 1" (25mm) minimum extension all around, for flush-mounted pull and junction boxes.
  4. Sheet steel cabinet, with hinged door and return flange overlapping sides, handle, [lock] and catch, for surface mounting.
  5. Electrical Trade Contractor shall provide a fuse storage cabinet, manufactured from 3mm thick aluminium 750mm high, 600mm wide, 300mm deep, hinged lockable front access door finished.
  6. In general, junction boxes, pull boxes, and cabinets shall be separate for each Building System. Each Trade Contractor responsible for the Building System shall provide a separate distribution system, with the exception of the data and communication system for the Owner's data, telephone, and communication use. For this only, systems may share the conduit and related accessories subject to restrictions of applicable codes and regulations. Wiring to control Building Systems shall not be installed in conduit and accessories assigned to the Owner's data and communications systems.
  7. Size accessories to distribution systems for future use and in accordance with codes and regulations for full capacity of conduits for number of conductors, deratings, and connections.
  8. Use suitable electrical boxes for terminations and junctions on conduit work. Install pull boxes where necessary to permit installation of conductors. Support pull boxes, outlet boxes, panels and other cabinets independently of conduit
  9. Install surface mounted devices, in cast conduit fittings, with threaded hubs and suitable stainless steel faceplates.
  10. Mount Cabinets with spare parts and fuses to not higher than 6'-6" (2,000mm) above finished floor. Comply with latest code requirements.
17. Equipment
  1. Provide power connection to all equipment scheduled on drawings or noted in specifications as "Owner-supplied", regardless of Division. This includes all hard-wired equipment, process equipment, and includes adapting outlets and devices to meet requirements of Owner's equipment plugs and fittings. "Owner-supplied" means supplied by Owner to this Contract from a source outside this Contract. All equipment required in the Contract is by definition NOT Owner-supplied.
  2. Approximate locations of electrical equipment, fixtures switches, outlets, and the like, are given on the drawings. Refer to architectural drawings and room elevations for application. In absence of detailed exact location of outlets shall be determined on site as work progresses.
  3. Confirm capacity, ratings and characteristics of equipment and items supplied by other Trade Contractors that are being powered by the Electrical Trade Contractor. Resolve discrepancies before beginning power installations.
  4. Unless specifically noted on mechanical or electrical drawings and schedules, all motor starters for equipment will be supplied by the Trade Contractor that supplies the equipment, for

installation and connection by the Electrical Trade Contractor under the work described in the Electrical Divisions.

5. Co ordinate the exact location and verify characteristics of electrical provisions for work described by Mechanical during the bidding period, and confirm upon Contract start.
6. The locations of starters, motors and associated equipment shall be coordinated with other Trade Contractors. Co ordinate with the work of such Trade Contractors to ensure proper location of equipment. The exact locations of conduit terminations at electrically-powered units shall be determined from equipment manufactures' shop drawings as approved by the Trade Contractor responsible for the system and accepted by the Consultant. Conduits must be installed to enter only in the locations designated by equipment manufacturers.
7. The right is reserved by the Owner and Consultant to alter the location of equipment and outlets a distance of up to 10' (3.0 metres) without involving a change to the Contract amount, providing notice is given prior to installation.
8. Provide power wiring and connection to equipment where noted, regardless of supply by any Trade. Provide all necessary wiring and connections that are "in line" in 120V and larger power wiring portions of the Electrical Distribution System, including wiring and installation of starters, interrupting thermostats, aquastats, speed controllers and time switches controlling equipment by interrupting the power feed to the equipment or device. Where systems and equipment have a power feed connection to a system control panel that incorporates line voltage power, and components of the system (including motors and equipment of whatever voltage) are then fed from that control panel, then the Trade Contractor responsible for that system shall provide the wiring and connection of such subsequent equipment and devices that are "down line" from the control panel unless specifically noted otherwise on mechanical or electrical drawings. The Trade Contractor, upon award of Contract, may elect to contract with the Electrical Trade Contractor for such work, but shall bid the work as set out herein.
9. Wire and connect weatherproof unfused safety disconnect switches except as specifically noted above, fastened to exterior of roof mounted units, to acceptance. Electrical Trade Contractor shall supply such devices unless drawings and schedules for such units specifically note that such disconnects are factory-installed or manufacturer supplied. Where unit has been supplied without such protection, even though scheduled on drawings or noted in the specification, supply disconnects at the relevant Trade Contractor's cost and at no cost to the Owner.
10. At time of bidding and at award of Contract, inspect Equipment Schedules and specifications of this and other Divisions for further detail. Incorporate all electrical work reasonably inferable from such inspection. The Electrical Trade Contractor is specifically cautioned that connections and powering of equipment and devices is not limited to the electrical and mechanical divisions, but includes other divisions of the specification and work.
11. Where motor starters, switches and similar items are grouped together, a suitable 19 mm (3/4") thick plywood panelboard shall be provided to which all such items shall be secured. Provide all necessary angle iron supports for support of panelboard and paint entire assembly with two coats of fire retardant type enamel approved by authorities and accepted by the Consultant.
12. Sprinkler proof equipment is not required this Contract as the building does not contain a sprinkler system, excepting only in former garbage and recycling rooms
13. Where equipment may be subject to damage from users with hoses, washdowns, adjacent exposed mechanical systems under pressure, or non-pressurized mechanical systems overhead, all such equipment shall be supplied as follows:
  1. Louvres facing outward and downward where openings are required for heat dissipation. Expanded metal screening is not acceptable.
  2. CSA-certified sealing rings for rigid steel galvanized conduit and CSA-certified raintight connectors for steel galvanized electrical metallic tubing (EMT) or other raceways.
  3. Provide seal rings and raintight connectors on all conduit terminations entering the top or

side of all enclosures and for all conduit terminations for pull boxes, junction boxes, splitter troughs, wireways, auxiliary gutters, cable troughs and disconnect switches installed below the level of the sprinkler heads.

#### 18. Grounding

1. Ground and bond all electrical systems to provisions of the Ontario Electrical Safety Code.
2. Provide grounding electrodes to Section 10 of the Ontario Electrical Safety Code.
3. Install grounding conductors to permit the shortest and most direct path from equipment to ground. Install grounding conductors in rigid galvanized conduit with both conductor and conduit bonded at both ends. Provide bonding jumpers with accepted clamps to maintain ground continuity of metallic raceway systems at all expansion joints.
4. Ground connections to grounding conductors shall be accessible for inspection and made with accepted solderless connectors bolted to the equipment of structure to be grounded. Clean contact surface prior to making connections to ensure proper metal to metal contact. Connections shall be of the type that grounds both conduit and conductor, and cap screws, bolts, nuts and washers shall be silicon bronze.

#### 19. Backboards

1. Provide backboards where indicated.
2. Backboards shall be minimum 3/4" (19mm) thick, good one (1) side fire retardant plywood backboards, pressure impregnated with fire retardant chemicals, and stamp, to CSA 080.
3. Construct each backboard in a rectangular shape of the size as indicated. Where no size is indicated, provide a backboard a minimum 4" (100mm) higher than the equipment. Where more than one (1) piece of equipment is installed on the backboard, construct the backboard of a size to suit the maximum vertical and horizontal dimensions of the equipment.
4. Finish each backboard with one (1) coat of primer followed by a minimum of one (1) finish fire retardant coat of ASA 61 grey paint prior to installing any equipment.
5. Set all backboards out from face of wall using 2x4 nominal studs at 16" (400mm) on centre to form a 3.5" (90mm) wire chase behind the backboard. Provide 4" (100mm) diameter holes throughout the backboard to facilitate cabling management and smooth all edges of holes. Coordinate locations of holes with Owner and communications trades.
6. Fastenings:
  1. Fasten each backboard to a wall or to a support structure using cadmium plated hardware. Provide a flat washer under the head of each fastener. Recess the head of the mounting bolt where equipment, including future equipment, is to be installed.
  2. Use expansion shields, toggle bolts or other types of wall fastenings to suit the wall type. Align the mounting bolts with the wall studs for stud type walls.
  3. Install fastenings a max. 20" (500mm) apart in both the vertical and horizontal directions.
  4. When installing equipment heavier than 50kg, fasten the equipment through the backboard directly to the wall or support structure.

#### 20. Sequences of Operations and Building System Requirements

1. Complete controls for each Building System shall be provided by the Trade Contractor responsible for the Building System in order to achieve a complete and operating system, working in conjunction with the electrical trade contractor. Notwithstanding any responsibility of the electrical trade contractor for supply and/or installation of control related wiring or devices, all such work shall be carried out under the supervision of the individual responsible for the Building System as set out in Division 1. See Building System Requirements for co-

ordination.

2. Under no circumstance shall a Building System or alteration to a Building System be provided in this Contract without the means to operate to achieve design intent and all sequences of operation that it must perform in expected service condition. All such work to achieve this performance, including components and installation, is required by this Contract.
3. All Trade Contractors and the Contractor are specifically cautioned that Building Systems must be provided with all controls, wiring, and components necessary for their operation, exclusive of any automated building energy monitoring or energy management control system. The function of such monitoring systems is to monitor and provide additional control that improves the energy performance of the Building System. Such systems do not replace the control of a Building System's components in relation to each other.

#### 21. Neutrals and Phasing

1. Provide one (1) identified grounded neutral conductor for each set of branch circuits connected to different mains of each panel.
2. For circuits identified as computer dedicated (D) or isolated ground (IG) or for LED lighting, provide individual neutral per identified circuit.
3. Install a separate neutral for each GFCI circuit when the GFCI is located at the panelboard.
4. Connect two or three (2 or 3) circuits sharing a common neutral to different mains or phases.
5. Balance the connected loads across the mains of each panel to within 15%.
6. Circuit numbers on the panels must correspond to the numbers on the Drawings.
7. Connections in all equipment to be Phase A, B and C (if applicable) from left to right, and front to back when viewing from the front or accessible direction.

**END OF SECTION**

## 1. GENERAL

1. The intent of the Interior Lighting system is to provide glare-free, energy efficient and sufficient artificial electric lighting for occupants and their safety and tasks, operated such that upon activation of a switch or occupancy sensor or other control within a building area, the portion of the system shall activate as shown on drawings. The system may function in combination with a local occupancy sensor or daylighting sensors, to provide further energy efficiency and longer component life (see drawings and device schedules).
2. The system is existing, for modification by this Contract as indicated on drawings and to specifications.
3. The number of devices of this system shall be confirmed by this Trade Contractor by review of both electrical and architectural drawings. Provide the larger number of devices of each type where drawings differ.
4. Upon confirmation of luminaire supply, submit shop drawings, indicating all components, enclosures, accessories, and brackets. Verify catalogue references and coordinate with installation conditions, with particular regard to existing wall construction, before ordering fixtures.
5. Cooperate with work described in other Sections to install the System so that it will not conflict with architectural, mechanical, structural or other electrical work.
6. Catalogue reference numbers given for individual fixture types are intended as a guide when read with the description and the fixture as finally applied. Verify catalogue references with description and coordinated with installation conditions, with particular regard to ceiling construction details, type and finish before ordering fixtures.
7. Warranties Schedule: The following extended warranties on products shall be furnished for this system:
  1. ballasts and LED drivers shall be warranted against manufacturer's defects, on a complete replacement cost basis, for 2 (two) years following Substantial Performance of the Work.
  2. LED fixtures shall be warranted against manufacturer's defects, on a supply cost basis, for 10 (ten) years following Substantial Performance of the Work.
  3. fixtures shall be replaced by this Trade Contractor, at no cost to the Owner, whenever any failure occurs within the 1 (one) year contract warranty period, no matter the cause except wilful Owner or public damage. In every case, investigate the cause of failure, and make good any cause other than defective fixture.

## 2. PRODUCTS

1. Provide all interior lighting products with CSA labels or appropriate approvals for all mounting conditions. Provide all accessories necessary to suit mounting conditions.
2. Provide luminaires as scheduled c/w all ballasts, lenses, lamps, accessories and appurtenances.
3. Plastic lenses in lighting fixtures shall be acrylic with minimum thickness of 3 mm (.125 inches) and, providing flame spread and smoke density ratings, complying with applicable Federal and Provincial Codes; Ontario Fire Marshal's Fire Safety Design Standard; and the Ontario Building Code. Paragraph 3.1.13.1 (1).
4. Removable components of fixtures (louvres, lenses, wire guards, and the like) to be limited to maximum 48" in length.

5. All luminaires in ceilings shall be separately supported to structure above to meet regulatory requirements.
6. All dimmers shall be Lutron, purpose-built for LED lighting control.
7. All occupancy sensors shall be WattStopper dual technology, for ceiling mount 360 degree operation.

### 3. EXECUTION

1. Remove existing luminaires, controls, and wiring of the existing interior lighting to the portions of building to be selectively demolished, and dispose by recycling all components. Make safe all existing electrical connections and cap to facilitate further demolition of walls, ceilings or other components. Relocate conduit, wiring and devices to suit new lighting and re-use existing where practical and where installation meets present codes. Otherwise provide new.
2. Do not use new devices for temporary and construction lighting except where the Work is nearing substantial performance and all construction operations generating dust or contaminants have ceased for the duration of the Contract.
3. Install all devices and accessories and control complete to locations shown on drawings, and coordinate with the work of other trades to ensure clearances for access. Perform all work to the requirements of Section 260500 and 260501.
4. Install all LED lighting with dedicated neutral to each circuit. Do not share common neutral.
5. Test and commission the Interior Lighting System in accordance with the prescribed requirements of Division 1 and this Section, and as follows:
  1. Adjust light level in each washroom with dimmer, after burn in period, to achieve uniformity of light level at floor level to match light level in other rooms, and to achieve required light level for accessibility.
  2. All interior lighting shall be linked to occupancy sensors in each space. Commission occupancy sensors for 5 minute maximum operation without detection.
6. Operate all systems to full capacity and verify proper, safe, efficient function of all components and of each complete system. Note that portions of the Interior Lighting System are required to be interlinked with the Emergency Lighting System such that upon power failure to building these fixtures shall function on emergency battery power.
7. Clean luminaires immediately before final acceptance, regardless of previous cleaning.
8. Instruct Owner in the care, maintenance and operation of all components of the Interior Lighting System.

**END OF SECTION**

## 1. GENERAL

1. The intent of the Emergency Lighting System is to provide a sufficient level of illumination to paths of emergency egress where power to the facility's normal system of interior lighting is interrupted as well as provide way-finding to and along the paths of egress at all times. It consists of two interrelated subsystems: emergency lighting and exit signage. Installation shall conform to the most stringent of applicable codes and standards. Electrical power is supplied by dedicated electrical circuits during normal operation, and by self-contained batteries within the components of the emergency lighting system itself.
2. The system is existing, subject to modification of existing exit sign locations, as well as the provision of new exit signs.
3. Confirm all device locations with authorities having jurisdiction prior to installation.
4. The minimum required period of emergency illumination for each device shall be 30 minutes. Submit Emergency Lighting System certification of battery tests to achieve Code-required illumination levels and periods under battery operation of the system.
5. To Extended Warranties Schedule: ALL batteries shall be warranted against manufacturer's defects, on a replacement cost basis, for 2 (two) years following Substantial Performance of the Work.

## 2. PRODUCTS

1. Emergency and Exit Signs shall meet the OBC 2012 requirements and be as scheduled. Exit lights consist of Frames shall be of industrial grade polyvinyl chloride with a gasket around lenses and canopy designed for anticipated service use. Exit lights shall consist of green pictogram symbols with white running-man and directional arrows as indicated.
2. The devices shall automatically self test for 5 minutes every 30 days, 30 minutes every 60 days and 30 minutes annually. A "Service Required" lamp shall be located near the test switch and flash when a fault is detected. A two-LED diagnostic display shall be located inside the equipment and shall identify the eventual source of failure (battery, charger circuitry, or lamps).
3. The devices shall operate with universal two-wire AC input voltage from 120Vac to 347Vac and universal two-wire DC input voltage from 6Vdc to 48Vdc and shall be sized to power remote heads and exit signs as shown on drawings or as practical for device locations, and to standards and codes.

## 3. EXECUTION

1. Install exit signs so that complete face of signs are clearly visible without interference by any other building system or element, without exception. Ensure that units can be serviced without interference, including where face of unit requires clearance for removal during servicing.
2. Install emergency lighting so that lighting heads supply Code required levels of illumination to paths of egress and building areas without interference by any other building systems or element.
3. Locations of units shall confirmed onsite with Consultant prior to rough-in.
4. All electrical practice and wiring shall conform to Sections 260500 and 260501.
5. Instruct Owner in the care, maintenance and operation of the Emergency Lighting System.

## END OF SECTION

## 1. GENERAL

### 1. General Instructions

1. Comply with Division One, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.
2. Comply with requirements of Section 260500 and 260501 as if repeated here.

### 2. System Intent

1. The intent of the Exterior Lighting system is to provide glare-free, energy efficient and sufficient artificial electric lighting for the exterior of the facility and grounds, operated such that upon activation of control devices such as photocells or timers, the system shall activate as shown on drawings.
2. This Contract requires removals and alteration of the existing Exterior Lighting System to accommodate other Work as set out on the drawings, as scheduled, and as specified in the Electrical Divisions and this Section. Remove existing exterior lighting where indicated, and dispose including feed and junction where there is no new fixture for the location. Make safe all existing electrical connections and cap. Relocate existing conduit, wiring and devices to suit new lighting layout as a renovation of existing circuitry only where such wiring conforms to latest code.
3. The number of devices of this system shall be confirmed by this Trade Contractor by review of both electrical and architectural drawings. Provide the larger number of devices of each type where drawings differ.
4. Exterior luminaires and mounting brackets shall be supplied by supplier, complete. Fixture supply and installation including bracket to suit location is included in this Contract.

### 3. Submittals

1. Submit in accordance with Division 1 and Section 260500: Luminaire shop drawings, indicating LED assemblies, drivers, enclosures, accessories, and poles wherever indicated or scheduled on drawings.

### 5. Coordination

1. Co-ordinate the layout and installation of the Exterior Lighting System with other building systems and existing conditions in accordance with the order of precedence for systems set out in Sections 019010 and 260500. Provide modifications to the existing exterior lighting system where necessary to accommodate changes being made to the existing conditions.

### 6. Reference Standards and Codes

1. Conform to requirements for reference standards and codes set out in Section 260500 and:
  1. Referenced engineering standards and recommendations in the Documents;
  2. The governing electrical codes and regulations; and
  3. The Ontario Building Code requirements for emergency lighting and egress

### 7. Warranties

1. Warrant all components of this system in accordance with Division 1, Section 260500, and LED drivers shall be warranted against manufacturer's defects, on a replacement cost basis, for 2 years following Substantial Performance of the Work.

8. Building Systems Requirements

1. In addition to the Exterior Lighting System, the work described by this Section is related to the other Building Systems as defined in Section 019010 and discussed elsewhere in this Section. Comply with requirements for performance, review, and co-ordination of such relations as set out in that Section.

**2. PRODUCTS**

1. Provide all products with CSA levels or appropriate approvals for all mounting conditions.
2. LED drivers, where scheduled shall be certified as latest tested and verified manufacturer's model.
3. Provide luminaires complete with appropriate fittings to mount luminaires on walls.
4. Exterior Lighting shall be controlled as set out on the electrical drawings and notes. Provide all necessary contactors and equipment to suit the method of control and number of circuits.
5. Notwithstanding any provision or diagramming in Division 26 or drawings, manual override shall be provided for all exterior lighting systems, for test purposes.
6. Provide all power wiring and feeds from luminaire locations to control device locations.
7. Where drawings or system schematic call for photocell operation of lighting circuits, photocell shall be supplied, and to a location to the building exterior that shall be confirmed with the Consultant prior to rough-in.

**3. EXECUTION**

1. Installation of exterior lighting luminaires, recessed junction boxes, conduit, wiring and wiring connections shall be to the requirements and standards described in Section 26501 Basic Materials and Methods, and further as recommended by the Product manufacturers.
2. Support devices from building elements. Coordinate support with existing conditions.
3. All LED lighting shall have dedicated neutral to each circuit. Do not share neutrals across circuits.
4. Test and commission the Exterior Lighting System in accordance with the prescribed requirements of Division 1 and this Section, and as follows:
  1. Adjust any time-clock settings to suit Eastern Standard timezone and Owner's requirements for sequence of operation. Verify operation.
  2. Verify operation of any photocells in the system.
5. Upon handover of completed Work, instruct Owner in the care, maintenance and operation of all components of the Exterior Lighting System.
6. Orient devices preliminarily as instructed by the Consultant, for final aiming during nighttime aiming commissioning.
7. Devices shall be cleaned immediately before the time of final acceptance, regardless of previous cleaning.

**END OF SECTION**

## 1. GENERAL

### 1. Owner Nominated Communications Trade Contractor.

1. **Communications Systems Work shall be undertaken by one of the following Communications Trade Contractors as accepted by the Owner:**
  1. **Network Communications Cabling Corp**
  2. **Fire Monitoring of Canada (Bulldog Fire/Security)**
  3. **Anthem Construction**
2. **Bidding Contractors shall communicate with these Trade Contractors to obtain bidding for the Communications Systems Work as set out in the Section, and to Owner's standards.**

### 2. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.
2. Comply with requirements of Section 260500 – Electrical General Work Requirements, which form part of this Section as if repeated here.
3. Comply with requirements of Section 260501 – Basic Materials and Methods, which form part of this Section as if repeated here.
4. In addition to the above, particular contract requirements for the Communication Systems (telephone, data, audio/video systems and similar systems) are described in this Section. Contract requirements related to this system may be described in other Sections of the specification and/or on drawings and in schedules, as follows:
  1. Requirements for conduit, j-hooks, and raceway components of this system, as supplied and installed by the Electrical Trade Contractor in accordance with the general provisions of Division 26 and to support the Communication Systems,
  2. Requirements for related systems, and components of related systems, that provide inputs and outputs to this system, such as existing Facility and site communication, Facility and site data cabling, Rogers and Bell lines.
  3. Requirements for interior mounted junction boxes to accommodate the devices of this system, in accordance with the general provision of Division 26.
  4. Requirements for systems that are indirectly affected by this system.
5. All rough-in work for the Communication Systems shall be provided by the Electrical Trade Contractor as part of this Contract. This work includes but is not limited to the provision of penetrations, sleeves, fire-stopping, conduit, junction boxes and device boxes.
6. ALL raceways and wiring work for the Communications Systems shall be provided by the Communications Trade Contractor as part of this Contract. This work includes but is not necessarily limited to the provision of all wiring and cabling, terminations to all cabling as set out in this specification, and termination lengths sufficient to allow the Owner's forces to install Devices following occupancy of the Building to the required sequence of construction.
7. ALL accessories and Appurtenance for Communications Systems shall be provided by the Communications Trade Contractor as part of this Contractor. This work includes, but may not necessarily be limited to patch panels and wall boxes. Connections of terminations from patch panels and/or wall boxes to Equipment and or Devices being provided by the Owner's forces, shall be by the Owner's forces following occupancy of the Building.
8. This Trade Contractor shall test ALL wiring and cabling provided by this Section, and shall submit written point-to-point reporting verifying performance of cabling and terminations.

3. Related Requirements

1. The Contractor, Electrical Trade Contractor, and Communications Trade Contractor are specifically cautioned that Work requires achievement of the performance objectives for this building system described in Section 019010, Section 260500, Section 260501 and this Section. The Contractor and Electrical Trade Contractor shall organize and shall provide all construction and related services reasonably inferable as necessary to achieve the performance objectives and intent of the design.
2. Inspect all specifications and drawings, to ensure that the contract requirement for provision of complete and functioning Communication Systems throughout the Work are achieved.
3. The Contractor, Electrical Trade Contractor, and Communications Trade Contractor shall:
  1. provide construction to supply Products and materials in accordance with Section 016010 and execute the installation work in accordance with Section 017010 to meet the performance requirements for anticipated service life of the systems;
  2. provide the design of connections and fasteners as set out in Section 017010; and
  3. provide related services as set out in the general provisions of the Contract.

4. Systems Intent

1. **The intent of the Communication Systems is to provide all rough-in and terminated cabling:**
  1. **From all WIFI access points located within rooms and spaces throughout the Facility, to patch panels and equipment backboards located at demarcation points (which are located in electrical rooms) on each floor level; and**
  2. **From the above demarcation points and equipment backboards to the main electrical and communications room located in the basement, within separate zone conduits for each floor level and to the Maintenance Office; and**
  3. **As further described in specifications or on Drawings.**
2. The routing of the raceway and wiring components of this building system shall be subject to the precedence of all other building systems, where interference with proposed routing is encountered in the Work or in relation to existing conditions. Accommodate components of other building systems in laying out new portions of this system.
3. The location of components of this system shall be confirmed in relation to all other building systems so that they perform in their role as components of the Communication Systems. Other system components shall be installed to ensure a clear relation between devices of this system and the spaces and occupant tasks they serve. Where interference cannot be avoided by relocation of the device, provide a further device. Where such interference is brought to the Consultant's attention prior to installation of the interfering component and the device, the Consultant will instruct regarding relocations or request an additional device at Owner's expense. Where such interference is not brought to the Consultant's attention prior to installation of the interfering component, the Contractor shall provide relocation and/or additional device at no expense to the Owner.
4. The intent of the layout and rough-in of raceways and wiring for Communications System that systems maintenance can occur primarily within ceilings of corridors or shared spaces, so as to minimize maintenance and/or cabling interruptions within individual rooms or spaces.
5. Patch Panels provided as part of Communications systems additionally receive inputs from the Video (CCTV) Surveillance subsystem of the Security Systems. All patch panels shall be sized to suit requirements of both of these systems.

5. Work to Existing Building
  1. Inspect & conform to the requirements for existing conditions, this project & existing building.
6. Pre-Installation Conferences
  1. Schedule during initial phases of project start-up a meeting with the Consultant, the Owner, the Electrical Consultant and Communications Trade Contractor, to review and confirm the means and methods proposed for installation of the systems, and to ensure that the location, intent, and requirements of the systems are clearly understood by the Contractor, the Electrical Trade Contractor, and the Communications System Trade Contractor, who will perform the work of this system.
7. Sequencing
  1. Plan and sequence work to permit installation of materials in conjunction with related materials so that the performance intent of the systems is achieved. Trades shall strictly conform to sequencing requirements for Environmental Separation Systems. Such requirements shall have primary precedence over all other construction sequences.
8. Submittals
  1. Submit in accordance with Division 01 requirements: and
    1. All Products used in Communications Systems.
    2. Layout of routing for all zone conduit, coordinated with all other building services, structure and existing conditions.
    3. Layout of all components and backboards in HUB rooms and main Electrical room, for acceptance by Owner.
    4. Confirmation of Patch Panel sizing to suit number of devices in Communications and Video (CCTV) Surveillance Systems.
    5. Schedule of device/wiring labelling, for Owner review and acceptance.
9. Coordination
  1. The Electrical Trade Contractor shall co-ordinate the layout and installation of conduit for the Communication Systems with other building systems and existing conditions.
10. Reference Standards
  1. Conform to requirements for reference standards and codes set out in Section 260500, in the Electrical Specifications on Electrical Drawings, and Division 1.
11. Quality Control
  1. The provision of Communication Systems shall be performed by experienced datacom cabling installation forces, working under the direction of the Electrical Trade Contractor, and having a minimum of three (3) years experience in similar cabling installations.
12. Basic Product and Execution Requirements
  1. The work described in this Section shall be performed to meet the standards and requirements for supply and installation of products and materials, and related services, set out in Division 1, Section 260500, and Section 260501.

13. Commissioning

1. Perform commissioning requirements in accordance with Division 01 requirements to ensure the proper function of components of the system, and the system.
2. Perform point-by-point verification of ALL wiring installed in Communications Systems, to confirm function, prior to handover to Owner. Where wiring fails, no matter the cause, remove and replace such wiring at no cost to Owner.

14. Closeout Documents

1. Submit in accordance with Division 1 requirements, and:
  1. Mark-up as-builts locations and routing of all zone conduit.

15. Warranties

1. Warrant in accordance with Division 1 requirements, and:
  1. All structured cabling shall be subject to manufacturer's warranty, for minimum 25 (twenty-five) years, from date of Substantial Performance of the Work.
  2. The Communications System shall be warranted by the Electrical Trade Contractor and Communications Trade Contractor, in accordance with requirements of 019010.

15. Building Systems

1. The work described by this Section is related to the following Building Systems as defined in Section 019010 and discussed elsewhere in this Section. Comply with requirements for performance, review, and co-ordination of such relations as set out in that Section:
  1. The Barrier Free Path of Travel Systems;
  2. Interior Finishes System;
  3. Grounding and Bonding Systems;
  4. Existing site communications System feeds to the Building;
  5. Fire Separation Systems, for penetrations through rated assemblies;
  6. Structural System, for supports for communications systems;
  7. Security Systems Video (CCTV) Surveillance Subsystems.

## 2. PRODUCTS

1. Devices

1. Devices for Communication systems shall be supplied and installed by the Owner's forces following occupancy of the facility. This includes all Wireless Access Point (WIFI AP) devices.

2. Raceways & Wiring

1. Raceways

1. Raceways shall be supplied and installed as part of this Contract. Provide raceways in accordance with Section 260501, the Electrical Specifications on Electrical Drawings, to all locations indicated on drawings and in schedules, and as further described herein.
2. Communication Systems shall be in dedicated conduits complete with pull string:
  1. Within wallboard ceilings, from the device location to the nearest accessible (lay-in) ceiling space, conduit shall be EMT or rigid conduit to 260501.

2. From central HUB locations to the main electrical room in the basement, provide continuous zone conduits, minimum 3"Ø with radius bends.
    3. Provide J-hooks where indicated on Electrical Drawings.
  3. Devices located in exposed ceilings and deck shall have dedicated conduit installed to nearest accessible dropped ceiling, laid out and installed to locations agreed with the Consultant prior to installation.
2. Wiring and Cabling
  1. Cabling from WIFI AP locations to HUB Rooms:
    1. CAT6 cable: home-run from each device location to the HUB room patch panels
    2. Terminations in HUB rooms: Ortronics KS6A-45 CAT6 Keystone Jack - Green
    3. Termination at the WIFI AP: Ortronics KS6A-45 CAT6 Keystone Jack - Green for Wi-Fi with a box jack (Ortronics OR-KSSMB1-88 Keystone Plastic Surface Mount Box).
    4. Feed device locations above dropped ceilings in corridors.
  2. Cabling in Zone Conduit from HUB rooms to Main Electrical Room:
    1. 12 Strand, 6 Pair Single Mode Fiber,
    2. Leave minimum 10'-0" (3.0m) of spare on each end coiled up,
    3. Terminated in corning boxes, mounted on the wall,
    4. Terminated in SC connections.
  3. See also Accessories & Appurtenances this Section for patch panel requirements.
3. Under no circumstances shall raceways or wiring be permitted to run horizontally within partitions, within service shafts, or to penetrate service shafts not in conduit. All conduit and wiring shall proceed from such wall-mounted device location vertically and into dropped ceiling space above.
3. Hangers and Support
  1. Products and materials for hangers and support shall be as described in Section 260500 Basic Materials and Methods and the Electrical Specifications on Drawings.
  2. All hangers and supports, except supports for equipment, shall be provided by the Electrical Trade Contractor as part of the base contract electrical work.
  3. Install cabling to J-hooks provided by the Electrical Trade Contractor, to all locations where J-hooks are shown on Electrical Drawings.
4. Equipment
  1. All equipment for Communication Systems shall be provided by the Owner's forces following handover of the completed facility by the Contractor to the Owner.
5. Accessories and Appurtenances
  1. Patch Panels
    1. In Hub Rooms on each floor level, mounted to the equipment backboards, provide Ortronics OR-SPKSU48 patch panel.
6. External Connections
  1. Communications Systems may be connected to, or form components of other Building Systems, including but not limited to:

1. The Barrier Free Path of Travel Systems, by device boxes for height of installation;
2. Environmental Separation Systems, by penetration of the barriers of this system by conduit, boxes, and other items in the systems;
3. Interior Finishes System, for quality of appearance in the Work;
4. Grounding and Bonding Systems, for proper and effective grounding of communications backboards, to Code.
5. The Building Structural System for supports to u/s deck, as well as for coordination of feeds to floor boxes prior to pouring of concrete slabs-on-grade.
6. The Fire and Smoke Control Systems, for penetrations through fire separations and assemblies having a fire resistance rating, and fire-stopping of all penetrations. Where cabling within lay-in-panel ceilings penetrates in to HUB rooms, sleeving shall be provided, and fire-stop devices must be of a type that allows for removal or addition of further cabling through the sleeving, while maintaining the continuity of the fire separation and rating.

### 3. EXECUTION

1. Preparation
  1. Provide all conduit, to routing acceptable to Owner and Consultant.
2. General Installation
  1. Proper judgment must be exercised in executing the installation so as to ensure the best possible installation in the available space and to overcome local difficulties due to space limitations or interference of structural components.
  2. Location of equipment, devices and conduit shall be neat, in consistent relation to the building structural system rhythm and the requirements of architectural layouts.
  3. Verify fully all components of systems as required to ensure proper operation of all new devices, equipment and new system capacity.
  4. Comply with the Ontario Building Code and applicable electrical standards and code, except that where such Code references regulations and standards this Contract requires installation to the latest issued amendments and supplements of such regulations and standards. Conform to the most stringent requirement in each case.
  5. Comply strictly with the Owner's practices and standards for the systems, except that in case of more stringent provision in this Contract the more stringent requirement shall govern.
  6. Provide conduit for all systems. No communications wiring shall run outside of conduit except within open ceiling spaces All device locations shown on drawings for installation in walls and partitions shall be run in conduit to the nearest accessible ceiling space.
  7. Do not install junction boxes for communications systems devices back to back or within same stud space where partitions are identified as acoustic (a) partitions. Where devices are shown back to back adjust position to suit, to direction of Consultant and Owner.
  8. Install labels all communications systems conduit in accordance with Section 260501.
  9. Install pull string to all empty conduit.

**END OF SECTION**

## 1. GENERAL

1. Acceptable Security Systems Trade Contractors
  1. For the Video Surveillance (CCTV) Subsystem of the Security Systems
    1. **The CCTV portion of the Security Systems described by this Section must be provided by a CCTV System Trade Contractor, who is providing the warranty for the system, and who additionally must be one of the following firms as accepted by the Owner:**
      1. **JTS Fire and Security**
      2. **Fire-Monitoring of Canada**
      3. **Convergent Technologies Ltd**
    2. The provision of all wiring, devices and equipment shall be performed by the CCTV System Trade Contractor, bidding to and working under the Electrical Trade Contractor for the Work.
    3. The system is new, and the Trade Contractor, Electrical Trade Contractor, and Contractor shall include all work necessary to remove all existing security systems components, and to provide a complete new system to meet the performance requirements and contract requirements for this Project. This includes all programming, devices, equipment, and other necessary items to ensure a complete and functioning systems. The Work includes updates to programming and head end graphics and any user cards and new cards or fobs required by the Owner (maximum of 10 existing user updates and 10 new user issuances).
  2. For the Access Controls Subsystem of the Security Systems
    1. **The provision of cabling for the Access Controls portion of the Security Systems described by this Section must be provided by Fire Monitoring of Canada.**
    2. The provision of all wiring, devices and equipment shall be performed by the Access Controls System Trade Contractor, bidding to and working under the Electrical Trade Contractor for the Work.
    3. The system is new, and the Trade Contractor, Electrical Trade Contractor, and Contractor shall include all work required to provide new system to meet the performance requirements and contract requirements for this Project. This includes all programming, devices, equipment, and other necessary items to ensure a complete and functioning Access Controls system. The Work includes updates user cards and new cards or fobs required by the Owner.
2. General Requirements
  1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.
  2. Comply with requirements of Section 260500 – Electrical General Work Requirements, which form part of this Section as if repeated here.
  3. Comply with requirements of Section 260501 – Basic Materials and Methods, which form part of this Section as if repeated here.
  4. In addition to the above, particular contract requirements for the Security Systems are described in this Section. Contract requirements related to this system may be described in other Sections of the specification and/or on drawings and in schedules, as follows:
    1. Requirements for conduit, cable tray, and raceway components of this system, as supplied and installed by the Electrical Trade Contractor in accordance with the general provisions of Division 26 and to support the Security Systems.

2. Requirements for related systems, and components of related systems, that provide inputs and outputs to this system, such as telecom, security camera devices and recording systems, card reader access, alarm and intrusion detection devices. Note that automatic door operators, automatic entry systems, electro-magnetic locks to doorways, and similar components are NOT components of the Access Control systems, but are related systems that may have interconnection to this System.
3. Requirements for junction and back boxes to accommodate the devices of the systems.
4. Requirements for systems that are indirectly affected by this system.
5. Further descriptions and requirements for portions of Security Systems that are located beyond the building.
5. All rough-in work of conduit for the Security Systems shall be provided by the Electrical Trade Contractor. This work includes but is not limited to the provision of cable trays, penetrations, sleeves, fire-stopping, conduit, junction boxes and device boxes and cover plates to all locations indicated on drawings and as necessary for the systems and devices.
6. Unless otherwise described herein, ALL wiring of the Security Systems shall be provided by the Trade Contractor as part of this Contract. This work includes but is not limited to the provision of all wiring and cabling with termination lengths sufficient to allow installation of all devices.

## 2. Related Requirements

1. The Work requires achievement of the performance objectives for this building system described in Section 019010, Section 260500, Section 260501 and this Section. The Contractor and Electrical Trade Contractor shall organize and shall provide all construction and related services reasonably inferable as necessary to achieve the performance objectives and intent of the design.
2. The Contractor and Electrical Trade Contractor shall inspect all specifications and drawings, to ensure that the contract requirement for provision of complete and functioning Security Systems throughout the Work are achieved.
3. The Contractor and Electrical Trade Contractor shall:
  1. provide construction to supply Products and materials in accordance with Section 016010 and execute the installation work in accordance with Section 017010 to meet the performance requirements for anticipated service life of the systems;
  2. provide the design of connections and fasteners as set out in Section 017010; and
  3. provide related services as set out in the general provisions of the Contract.

## 3. Systems Intent

1. The Security Systems are made up of the following sub-systems:
  1. An Access Control System;
  2. A Video Surveillance (CCTV) System; and
  3. An Intrusion Detection System
2. The intent of the Intrusion Detection System is to monitor the building entrances and building interior to detect unauthorized intrusion and to provide warning and deterrent. The system is new by this Contract.
3. The intent of the Access Control Systems is to provide electronic but controlled access to the building, and to specific areas within the facility interior, working in conjunction with opening hardware and communications systems, all as set out in the Documents. The system is new by this Contract.

4. The intent of the Video Surveillance System is to monitor activity and behaviour in the building interior and throughout the site. The system is new by this Contract. All existing cameras wiring and devices shall be removed and disposed of, unless specifically noted otherwise, or as instructed by the Owner.
  5. The routing of the raceway and wiring components of this building system shall be subject to the precedence of all other building systems, where interference with proposed routing is encountered in the Work or in relation to existing conditions. Accommodate components of other building systems in laying out new portions of this system.
  6. The location of devices of these systems shall be confirmed in relation to all other building systems in the existing Facility and the Work so that such devices can perform their role as components in the Security Systems and its sub-systems. Other system components shall be installed to ensure a clear relation between devices of this system and the spaces and occupant tasks they serve. Where interference cannot be avoided by relocation of the device, provide a further device. Where such interference is brought to the Consultant's attention prior to installation of the interfering component and the device, the Consultant will instruct regarding relocations or request an additional device at Owner's expense. Where such interference is not brought to the Consultant's attention prior to installation of the interfering component, the Contractor shall provide relocation and /or additional device at no expense to the Owner where the interfering component has been installed as part of the Work.
  7. The Systems are existing to remain, for modification where indicated.
4. Work to Existing Building
    1. Inspect and conform to the requirements for existing conditions, this project, and existing building as set out in Section 260300.
  5. Pre-Installation Conferences
    1. Schedule a pre-installation conference, prior to commencement of rough-in of systems components. Conference shall be with the Owner, the Owner's Security Systems designer and monitoring agent, the Owner's IT system designer, the Consultant, the Contractor, the Electrical Trade Contractor and the Trade Contractor(s) performing the Work of this Section
  6. Sequencing
    1. Plan and sequence work to permit installation of materials in conjunction with related materials so that the performance intent of the systems is achieved. Trades shall strictly conform to sequencing requirements for Environmental Separation Systems. Such requirements shall have primary precedence over all other construction sequences.
  7. Submittals
    1. Submit in accordance with Division 01 requirements, and:
      1. Product data sheets for all Products used in Security Systems.
      2. Component System Diagrams for each subsystems of Security Systems.
      3. Service Room Layouts, in both plan and elevation, for all service rooms (including but not limited to IT Hub rooms, etc.), and showing all backboards, external connections for power, and all other device box locations required for Security Systems. Show all Security Systems components in relation to all other system components within such spaces.
      4. Detailed Schedule for labelling of all wiring and raceways.
      5. Interference Drawings.
      6. Schedule of device/wiring labelling, for Owner review and acceptance.

8. Coordination

1. The Electrical Trade Contractor shall co-ordinate the layout and installation of conduit for the Electronic Safety & Security Systems with other building systems and existing conditions in accordance with the order of precedence for systems set out in Sections 019010 and 260300.
2. The Owner's Security Contractors shall provide instruction to the Electrical Trade Contractor regarding conduit and rough-in requirements to the Security Systems and shall confirm the location of all devices. Include all costs for this conduit and rough-in.

9. Reference Standards

1. Conform to requirements for reference standards and codes set out in Section 260300 and Division 1, including but not limited to the following applicable to this system:
  1. Referenced engineering standards and recommendations in the Electrical and Division 1;
  2. The governing electrical codes and regulations.

10. Quality Control

1. The provision of Security Systems shall be performed by experienced cabling installation forces, and having a minimum of three (3) years experience in similar cabling installations.

11. Basic Product and Execution Requirements

1. The Trade Contractors performing the work described in this Section is specifically cautioned that such work must be performed to meet the standards and requirements for supply and installation of products and materials, and related services, set out in Division 1, Section 260300, and Section 260305.

12. Commissioning

1. Perform commissioning requirements in according with Division 01 requirements to ensure the proper function of components of the system, and the system.
2. Perform point-by point verification of ALL wiring installed in Communications Systems, to confirm function, prior to handover to Owner. Where wiring fails, no matter the cause, remove and replace such wiring at no Cost to Owner.

13. Closeout Documents

1. Submit in accordance with Division 1 requirements.

14. Warranties

1. Warrant in accordance with Division 1 requirements.
  1. Warrant the CCTC subsystem network video recorder for a minimum of 5 (five) years, in accordance with the NBD KYHD Warranty.
  2. All structured cabling shall be subject to manufacturer's warranty, for minimum 25 (twenty-five) years, from date of Substantial Performance of the Work.

14. Building Systems

1. The work described by this Section is related to the following Building Systems as defined in Section 019010 and discussed elsewhere in this Section. Comply with requirements for performance, review, and co-ordination of such relations as set out in that Section:
  1. The Barrier Free Path of Travel Systems;
  2. Environmental Separation Systems (and its sub-systems);

3. Interior Finishes System;
4. Communications Systems;
5. Grounding and Bonding Systems;
6. Fire Separation Systems, for penetrations through rated assemblies;
7. Structural System, for supports for communications systems;

## 2. PRODUCTS

### 1. Devices

1. Devices for Video Surveillance System shall be supplied and installed by the CCTV Trade Contractor as an integral part of the construction sequence, and prior to occupancy of the facility. Devices may include, but are not necessarily limited to, cameras, security door contacts, motion sensors, or similar devices where noted on drawings or specified herein.
2. Devices for Access Control Systems shall be supplied and installed by the Owner's Access Control Contractor following occupancy of the facility. Devices include but are not necessarily limited to card readers. All conduit required between devices, howsoever supplied and installed, shall be provided by the Electrical Trade Contractor.

Door Hardware, including automatic door operators, bush button operators, push-to-lock hardware, electro-magnetic locks to doorways, magnetic hold opens to doorways, electric strikes and similar components are provided by the Door and Hardware provider, complete, as described elsewhere in Sections of the Specifications.

### 3. CCTV SubSystem Devices

#### 1. CCTV Cameras

1. PTZ Camera – Hanwha – Part #XNP-6400RW
2. Dome Camera – Hanwha – Part #QNV-8080R
3. Bullet Camera – Hanwha – Part #QNO-8080R
4. 360 Camera – Hanwha – Part #QNF-9010

2. Since model numbers change often, if one of the above CCTV camera Products is outdated, the Owner will accept the newest model number available.

### 4. Access Control SubSystem Devices

1. Card Readers shall be provided by the Owner, following occupancy of the Facility.

## 2. Raceways and Wiring

### 1. Raceways

1. Raceways shall be supplied and installed as part of this Contract, in accordance with Section 260501 and the Electrical Drawings.
2. All Security Systems wiring shall be in dedicated conduits. Provide conduit from device location to ceiling of basement floor level below.

### 2. Wiring and Cabling

1. Cabling shall be located and installed so as to eliminate interference from other electrically operated systems.
2. All cabling shall be terminated with connectors, permanently identified, and 100% tested for performance prior to handover to Owner for Owner's use in datacom systems.

3. Cabling from Camera locations to HUB IT Rooms:
  1. CAT6 cable: home-runned from each camera location to the HUB room patch panels supplied and installed by the Communications System Trade Contractor.
  2. Terminations in HUB rooms: Ortronics KS6A-45 CAT6 Keystone Jack - Blue
  3. Termination at cameras: Ortronics KS6A-45 CAT6 Keystone Jack – Blue, complete with a box jack Ortronics OR-KSSMB1-88 Keystone Plastic Surface Mount Box.
  4. Feed device locations above dropped ceilings in corridors.
4. Cabling from Card Reader locations to HUB IT Rooms:
  1. CAT6 cable: home-runned from each card reader location to the HUB room patch panels supplied and installed by the Communications System Trade Contractor.
  2. All terminations by Owner's forces.
  3. Leave minimum 10'-0" (3.0m) of spare on each end coiled up,
  4. All wiring required to ensure function of card readers, including where such devices operate electro-magnetic locks, electric strikes, or are interlinked with any other hardware, is included in the Contract Price, by the Electrical Trade Contractor.
3. Under no circumstances shall raceways or wiring be permitted to run horizontally within partitions, within service shafts, or to penetrate service shafts not in conduit. All conduit and wiring shall proceed from such wall-mounted device location vertically and into dropped ceiling space above.
3. Hangers and Support
  1. Products and materials for hangers and support shall be as described in Section 260501 Basic Materials and Methods and shall be included in the Work.
  2. All hangers and supports, except supports for equipment, shall be provided by the Electrical Trade Contractor as part of the base contract electrical work.
4. Equipment
  1. CCTV Security Subsystem Equipment:
    1. Network video recorder, to be located in Basement Electrical Room no. shall be SKV-T4-I7-16TB – Ionodes, and with the following:
      1. (1) Intel Core i7-12700K
      2. (2) 8GB DDR5 RAM
      3. (1) 256GB M.2 SSD
      4. (1) 4TB SATA HDD
      5. (1) 12TB SATA HDD
      6. (2) 1GbE RJ45
      7. (1) 500W PSU
      8. Windows 11 Pro
  2. Card Reader System Equipment:
    1. By Owner's forces following Occupancy of the Building.
  3. Other Equipment
    2. Emergency 911 Call System shall be Code Blue 2-e model, for integration into the Owner's network. The Access Controls Trade Contractor shall provide this call system. 1 (one) to be located at the main entry to the facility, within the Breezeway.

5. Accessories and Appurtenances
  1. All accessories and appurtenances for Security Systems shall be provided by the Owner's forces following handover of the completed facility by the Contractor to the Owner.
  2. Patch panels in HUB IT Rooms, and to which CCTV systems are externally connected to, shall be provided by the Communications System Trade Contractor.
6. External Connections
  1. Electronic Safety & Security Systems may be connected to other Building Systems, including but not limited to:
    1. Barrier Free Path of Travel Systems (height of devices)
    2. Fire Separation Systems (operation of opening protection hardware by Fire Alarm signal)
    3. Emergency Egress Systems (by control and release of opening hardware)
    4. Environmental Separation Systems (by penetration of the barriers of this system by conduit, boxes, and other items in the systems).
    5. Automatic Entry Door Systems (by override or further control of these systems)
    6. Interior Finishes System (for quality of appearance in the work to Communication Systems within and to Interior Finish components)
    7. Fire Suppression Systems connections, for Fire Detection and Alarm Systems only, as set out in Section 283100.
    8. Electrical Distribution Systems (Electrical Trade Contractor to provide power to and wire the power connection to equipment component of each sub-system, and to other powered devices as set out on Electrical Drawings.
    9. Grounding and Bonding Systems, for proper protection and operation of the system.
    10. To and from Communications Systems. Such connections shall be provided by the Communications Systems Trade Contractors concerned, working under Contract provisions as set out in Section 270500, except that commissioning of Electronic Safety & Security Systems that requires active and functioning and commissioned Communications Systems shall be performed by the Electronic Safety & Security Systems Trade Contractor for each system. By way of example, if an Intrusion Detection System requires notification off-site to an alarm monitoring company, using a phone line or data line connection, the phone line or data line shall be commissioned by the applicable Communications Trade Contractor. The performance requirement for notification across that line to the alarm monitoring company shall be provided and commissioned by the Intrusion Detection System Trade Contractor unless already existing at the Facility.

### 3. EXECUTION

1. Preparation
  1. Prior to installation, on site, lay out ALL exposed conduit and device locations for Consultant's acceptance. Provide concealed conduit except where authorized in writing by the Consultant. Revise conduit and device locations as directed by Consultant. Access Control and Intrusion Detection trade contractors shall provide the layout and shall inspect and approve the rough-in at building framing and rough-in stage. Submit acceptance reports.

2. Perform all work to systems in a manner that minimizes downtime for existing systems, regardless of number of mobilizations. Pay all costs for multiple mobilizations.

## 2. General Installation

1. Proper judgment must be exercised in executing the installation so as to ensure the best possible installation in the available space and to overcome local difficulties due to space limitations or interference of structural components.
2. Location of equipment, devices and conduit shall be neat, in consistent relation to the building structural system rhythm and the requirements of architectural layouts.
3. Comply with the Ontario Building Code and applicable electrical standards and code, except that where such Code references regulations and standards this Contract requires installation to the latest issued amendments and supplements of such regulations and standards. Conform to the most stringent requirement in each case.
4. Comply strictly with the Owner's practices and standards for the systems, except that in case of more stringent provision in this Contract the more stringent requirement shall govern.
5. Provide conduit for all systems. No security systems wiring shall run outside of conduit except where mounted exposed to existing curtainwall frames. All devices located in new window and new curtainwall framing shall be fed with wiring within the framing. Co-ordinate wiring paths and rough-in with the applicable Division 8 trade contractors.
6. Install labels on all security systems conduit in accordance with Section 260501.

**END OF SECTION**

## 1. GENERAL

### 1. General Instructions

1. **Fire Detection and Alarm Systems Work shall be provided by Troy Life & Fire Safety Ltd.**
2. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.
3. Comply with requirements of Section 260500 – Electrical General Work Requirements, which form part of this Section as if repeated here.
4. Comply with requirements of Section 260501 – Basic Materials and Methods, which form part of this Section as if repeated here.
5. In addition to the above, particular contract requirements for the Fire Detection and Alarm System are described in this Section. Contract requirements related to this system may be described in other Sections of the specification and/or on drawings and in schedules, such as:
  1. Requirements for related systems and components of related systems that provide inputs and outputs to this system.
  2. Requirements for systems that are indirectly affected by this system.
6. This Trade Contractor shall inspect the bid forms. Provide all items requested and required by the bidding Contractor to provide completed bid forms prior to Tender closing and in the manner set out in Section 260500, Electrical General Work Requirements.

### 2. Related Requirements

1. The Contractor and this Trade Contractor are specifically cautioned that Work requires achievement of the performance objectives for this Building System described in Section 019010, Section 260500, Section 260501 and this Section. The Contractor and Electrical Trade Contractor shall organize provision of the components of Building Systems to achieve the intent of the Building System design, and shall provide all products and execution reasonable inferable as necessary to achieve the performance objectives and intent of the design. All such work is included in the Contract and the Contract Amount. The methods and scheduling of the work to this system, including scheduling for multiple mobilizations to site and multiple verifications of the system by the trade contractor responsible for this system, are included in the Contractor's design for achievement of the Contract Time, all as set out in Division 1 of the Specification.
2. The Contractor and this Trade Contractor shall thoroughly review all Sections of the specifications and all drawings, to ensure that the contract requirement for provision of a complete and functioning Fire Detection and Alarm System throughout the Facility, while the Work is in progress and at Substantial Performance, is achieved.
3. The Contractor and this Trade Contractor shall:
  1. provide construction to supply *Products* and materials in accordance with Section 016010 and execute the installation work in accordance with Section 017010 to meet the performance requirements for anticipated service life of the assemblies;
  2. provide the design of connections and fasteners as set out in Section 017010; and
  3. provide related services as set out in the general provisions of the Contract and Division 1 and this Section.
4. The following components of the Fire Detection and Alarm System are described elsewhere:
  1. requirements for conduit, raceways, support, accessories, circuits, and wiring for the components of the System are described in Section 260501 Basic Materials and Methods.

5. The following related systems and components of related systems may provide inputs to and receive outputs from the Fire Detection and Alarm System. They may be additionally described elsewhere as noted:

- |  |                   |
|--|-------------------|
| 1. Door Hardware in Egress Systems (releases)                  | Section 087000    |
| 2. The Existing Passenger Elevator & Lift (operation controls) |                   |
| 3. Gas distribution System (valve closures where required)     | N/ A this Project |
| 4. Air Distribution System Equipment (shutdowns, sensors)      | Section 233000    |
| 5. Packaged HVAC System (shutdowns or similar)                 | Section 237000    |
| 6. Building Monitoring System                                  | Division 25       |
| 7. Communications Systems, for monitoring of System            | Division 27       |

6. The Fire Detection and Alarm System indirectly affects the following systems described elsewhere:

- |  |                |
|--|----------------|
| 1. Emergency Egress System (providing early warning)       | Section 019521 |
| 2. Fire Separation System (detectors, hardware hold-opens) | Section 019522 |
| 3. Barrier-free Path of Travel System (device locations)   | Section 019530 |

3. System Intent

1. The intent of the building Fire Detection and Alarm System is to provide early warning and life safety to building occupants and alert monitoring or fire fighting forces. The system consists of an existing Two-stage Fire Detection and Alarm System that shall be upgraded as part of the Work of this contract. Provide all devices and install as shown on drawings. Verify all new and relocated components and the finished system to meet CAN/ULC-S537-13 requirements.
2. The facility does not have an emergency generator system. The Fire Detection and Alarm System is thus powered by battery in case of emergency loss of electrical power to the system.
3. The Fire Detection & Alarm System includes, but is not limited to, the following components:
  1. existing and new devices for allowing occupants to activate the system, and existing and new sensing devices for activating the system, organized by zones and in accordance with applicable codes and regulations
  2. existing and new devices for providing warning to occupants upon activation of the system in accordance with applicable codes and regulations,
  3. supported conduit and raceways to organize and protect the system's distribution wiring,
  4. wiring to connect the devices of system to the control and annunciator panels in accordance with applicable codes and regulations,
  5. an existing central control panel, located in Reception (Room 125b),
  6. an existing annunciator panel, located at the main fire fighter building entry, Vestibule 126,
  7. a new passive fire alarm graphic with frame, installed in the entry Vestibule (Room no.126),
  8. physical supports and fittings to the system components,
  9. accessories and appurtenances to regulate, monitor, maintain, and supervise the system and protect against unsafe electrical flow and risk to occupants and property;
  10. further accessories and appurtenances to protect devices from tampering and damage from the shelter residents,
  11. existing electrical circuit controlling the panel of the system; and
  12. new electrical circuits, where indicated on Electrical Drawings, and provided by the Electrical Trade Contractor, to provide power to new devices.
5. The routing of the raceway and wiring components of this Building System shall be subject to the precedence of all other Building Systems, where interference with proposed routing is encountered in the Work. Accommodate components of other Building Systems in laying out new or relocated portions of this system, and make alterations to existing portions of this system to allow for alterations of existing conditions by other portions of the Work.

6. The location of devices of this system shall be confirmed in relation to all other Building Systems in the Work so that such devices can perform their role as components the Fire Detection and Alarm System. Other system components shall be installed to ensure a clear relation between devices of this system and the egress paths and spaces they serve. Where interference with devices of this system cannot be avoided provide a further device. Where such interference is brought to the Consultant's attention prior to installation of the interfering component and the device, the Consultant will instruct regarding relocations or request an additional device at Owner's expense. Where such interference is not brought to the Consultant's attention prior to installation of the interfering component, the Contractor shall provide relocation and/or additional device at no expense to the Owner.
  7. The location of devices of this system shall be confirmed by this Trade Contractor with authorities having jurisdiction prior to installation.
  8. This Trade Contractor shall evaluate the classification of this facility and portions of the Facility using the Ontario Building Code (OBC) matrix located on the architectural drawings, and shall inspect the OBC and applicable codes and regulations to confirm the selected location of each device. The Contract requires, regardless of general specification of devices, that each device be provided as required to meet the requirements of reference standards and codes.
4. Work to Existing Building and Related Requirements
1. Inspect and conform to the requirements for existing conditions, this project, and existing building as set out in Section 260500. Fire Detection and Alarm System is existing, presently maintained and monitored by a fire alarm service provider under contract with the Owner.
  2. Inspect the drawings and site in conjunction with the requirements of the specification and provide all routing work to accommodate the work of this Contract. Carefully establish required cutting and the patching of existing partitions, ceilings, and flooring assemblies and pay all costs for this work using other trade contractors qualified in the construction of such elements. This includes but is not limited to accommodating the work of this Contract to the following:
    1. Building Structural System
    2. Envelope Systems and Partitions
    3. Ceiling assemblies and work
    4. Mechanical and Electrical Building Systems in accordance with system precedence.
  3. Remove portions of the Fire Detection and Alarm System made redundant by the removal of the equipment of other systems, alterations to this system. Relocate conduit, wiring, devices, and equipment of this system as required to suit all new work described in other Sections and for changes to other Building Systems, working in cooperation with Contractor and Trade Contractors.
  4. The Contractor is cautioned that work to the system within the existing Facility must be undertaken with due regard for the existing interior finishes. Retrofit work undertaken to date with respect to existing components of this system in no way represents the quality of workmanship required by this contract. All routing and cutting and patching of existing portions of the Facilities must be disclosed to the Consultant and the means and methods agreed prior to performing such work. All cutting and patching of terrazzo, plaster, and similar original finishes must be performed using forces skilled in such work. Neither the Electrical Trade Contractor nor the Fire Detection and Alarm Trade Contractor shall undertake such work.
5. Construction Schedules
1. Refer to Division 1 and Section 260500 for scheduling requirements.
  2. Retain system in operation throughout all changes, except for short shutdowns during unoccupied periods, by arrangement with authorities. Contractor provides fire watch at its own expense where authorities or the Owner's insurer require this measure, at no further expense to the Owner.

6. Submittals

1. Submit in accordance with Division 01 and Section 260500 requirements, and:
  1. Prepare maintenance schedule. Contractor to mark shop drawings to provide "as-installed" record.
  2. Shop Drawings for the Fire Detection and Alarm System shall include copies of documents to substantiate ULC listing for all items, identified by catalogue.
  3. Submit Passive Fire Alarm Graphic for review and acceptance. Confirm all existing zones, for incorporation in to the graphics. Revise and resubmit graphics until accepted by Consultant.
  4. Provide copies of Inspection and Verification Certificates to Consultant, and Local Fire Department, Fire Prevention Division.

7. Co-ordination

1. The Electrical Trade Contractor shall co-ordinate the layout and installation of the Fire Detection and Alarm System with other Building Systems and existing conditions in accordance with the order of precedence for systems set out in Sections 019010 and 260500.
2. Co-operate with work described in other Sections to install the System so that it will not conflict with architectural, mechanical, structural or other electrical work.
3. Provide modifications to the existing Fire Detection and Alarm System where necessary to accommodate changes being made to the existing building and conditions by the Work, at no further cost to the Owner.

8. Reference Standards and Codes

1. Conform to requirements for reference standards and codes set out in Section 260500 and Division 1, including but not limited to the following applicable to this system:
  1. Local Fire and Building Department Requirements;
  2. Referenced engineering standards and recommendations in Electrical Divisions & Division 01;
  3. The governing electrical codes and regulations
  4. The Ontario Building Code requirements for Fire Detection and Alarm Systems, including commissioning and integrated testing requirements, as applicable
2. All components shall be CSA and ULC listed and labeled, acceptable to the Ontario Fire Marshal and the local Fire Department and suitable for operation on service characteristics noted. System equipment and operation and installation shall comply with the National and Provincial Building Code; Canadian Underwriters Association Standards CUA-70 and CUA-72A, Ontario Electrical Safety Code, and ULC Standard CAN/ULC-S524-14 and latest amendments.
3. ULC and CSA standards and Electrical Safety Code, shall establish minimum installation requirements.

9. Quality Control

1. Conform to requirements for quality control, standards of products, workmanship and services and to achieve tolerances as set out in Section 260500 and Division 1, including but not limited to the following applicable to this system:
  1. Provide all tests and inspections necessary to confirm the conformance of the altered and completed system to the applicable Codes and this Contract.

2. All work shall be performed by journeyman electricians licensed in the Place of the Work and experienced with the installation of products required by this Contract. The Fire Detection and Alarm Trade Contractor shall not further subcontract any of the work of this Section without full disclosure of this intention, and only then with the permission of the Owner. Where granted, the Contractor, the Lead Electrical Trade Contractor and the Fire Detection and Alarm Trade Contractor shall provide sufficient evidence and agreement regarding their full responsibility for the work of this Section.
3. Under no circumstances shall the work of the system commissioner as described in Division 1 and required by this Section be subcontracted from the Fire Detection and Alarm Trade Contractor (FDATC). The commissioner shall be in the direct employ of the FDATC and shall be its authorized representative.

#### 10. Temporary Facilities, Safety Requirements and Environmental Protection

1. Conform and cooperate to ensure requirements for temporary facilities, safety, cleaning and waste management, and environment as set out in Section 260500 and Division 1 are achieved throughout the course of the Work.

#### 11. Basic Product and Execution Requirements

1. The Trade Contractor performing the work described in this Section is specifically cautioned that such work must be performed to meet the standards and requirements for supply and installation of products and materials, and related services, set out in Division 1, Section 260500, and Section 260501.
2. Catalogue reference numbers given for individual devices and equipment types are intended as a guide when read with the description and the device, equipment, or modifying component to equipment as finally applied. Verify catalogue references with description and coordinated with installation and Existing Conditions, with particular regard to ceiling construction details, type and finish before ordering devices or equipment.

#### 12. Commissioning Requirements

1. Start-up, commissioning, and final commissioning are defined terms within this Contract, as described in Section 018010. Provide all such work to the system. No industry practice or common understanding shall detract from the definition of these terms as set out therein, or the requirement to perform start-up, commissioning, and final commissioning as set out in Division 1, Section 260500, and this Section.

#### 13. Record Documents and Contract Closeout

1. Perform and cooperate to achieve requirements for contract closeout procedures, submission of manuals, and preparation of record documents as set out in Section 260500 and Division 1.

#### 14. Warranties

1. Provide all warranties requested in Division 1, Section 260500, and this Section. Provide warranties strictly in the format set out in Division 1.
2. The following extended warranties on products shall be furnished for this system:
  1. batteries shall be warranted against manufacturer's defects, on a replacement cost basis, for 2 (two) years following Substantial Performance of the Work.
3. Warranties shall apply to the full system as altered, excepting only failure of existing pulls, horns, strobes, and similar devices.

14. Identification of Building Systems

1. In addition to the Fire Detection and Alarm System, the work described by this Section is related to the other Building Systems as defined in Section 019010 and discussed elsewhere in this Section. Comply with requirements for performance, review, and co-ordination of such relations as set out in that Section.

**2. PRODUCTS**

1. General

1. Manufacturer is based on the existing equipment described in this specification by Chubb/Edwards. No alternates will be accepted.

2. Fire Alarm Devices

1. Signal Devices

1. Horns and horn/strobes shall be used in this facility, to replace existing, and to provide outputs from this system.

2. Detector Devices Generally

1. Equip detectors with a mechanism or special tool so that the unit or part of the unit cannot be removed by unauthorized personnel.

3. Addressable Manual Pull Stations

1. Description: SIGA-270C, Addressable type, red, with molded, raised-letter operating instructions of contrasting color. Station will mechanically latch upon operation and remain so until manually reset by opening with a key common with the control units.
2. Protective Shield: Simplex Part Number: DPFASI. Where required, as indicated on the drawings, provide a tamperproof, clear LEXAN shield and red frame that easily fits over manual pull stations. When shield is lifted to gain access to the station, a battery powered piercing warning horn shall be activated. The horn shall be silenced by lowering and realigning the shield. The horn shall provide 85dB at 10 feet and shall be powered by a 9 VDC battery.
3. Provide a protective shield on pull stations in all common areas.

4. Addressable Smoke Sensors

1. General: Comply with ULC 268, "Smoke Detectors for Fire Protective Signaling Systems". Include the following features:
  1. Factory Nameplate: Serial number and type identification.
  2. Operating Voltage: 24 VDC, nominal.
  3. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore normal operation.
  4. Plug-in Arrangement: Sensor and associated electronic components are mounted in a module that connects to a fixed base with a twist-locking plug connection. Base shall provide break-off plastic tab that can be removed to engage the head/base lockign mechanism. No special tools shall be required to remove head once it has been locked. Removal of the detector head shall interrupt the supervisory circuit of the fire alarm detection loop and cause a trouble signal at the control unit.
  5. Each sensor base shall contain an LED that will flash each time it is scanned by the Control Unit (once every 4 seconds). In alarm, the sensor base LED shall be on steady.

6. Each sensor base shall contain a magnetically actuated test switch to provide for easy alarm testing at the sensor location.
  7. Each sensor shall be scanned by the Control Unit for its type identification to prevent inadvertent substitution of another sensor type. Upon detection of a "wrong device", the control unit shall operate and provide fire protection with the installed device at the default alarm settings for that sensor; 2.5% obscuration for photoelectric sensor, 135°F and 15°F rate-of-rise for the heat sensor, but shall indicate a "Wrong Device" trouble condition.
  8. The sensor's electronics shall be immune from nuisance alarms caused by EMI & RFI.
  9. Sensors include a communication transmitter and receiver in the mounting base having a unique identification and capability for status reporting to the FACP. Sensor address shall be located in base or electronically in the head detector to eliminate false addressing when replacing sensors.
2. Type: Smoke sensors shall be of the photoelectric type. SIGA-PS.
  3. Bases: Relay output, sounder and isolator bases shall be supported alternatives to the standard base. SIGA-SB or with relay/sounder/isolator as required.
  4. Addressable Duct Smoke Sensor: Standard smoke sensor in sealed duct mounted housing.
  5. Addressable Duct Smoke Sensor: SIGA-SD, photoelectric type, with sampling tube of design and dimensions as recommended by the manufacturer for the specific duct size and installation conditions where applied. Sensor includes relay as required for a shutdown.
    1. Environmental compensation, programmable sensitivity settings, status testing, and monitoring of sensor dirt accumulation for the duct smoke sensor provided by FACP.
    2. The Duct Housing shall provide a supervised relay driver circuit for driving up to 15 relays with a single "Form C" contact rated at 7A @ 28VDC or 10A @ 120VAC. This auxiliary relay output shall be fully programmable. Relay shall be mounted within 3 feet of HVAC control circuit.
    3. Duct Housing shall provide a relay control trouble indicator Yellow LED.
    4. Duct Housing shall have a transparent cover to monitor for the presence of smoke. Cover shall secure to housing by means of four (4) captive fastening screws.
    5. Duct Housing shall provide two (2) Test Ports for measuring airflow and for testing. These ports will allow aerosol injection in order to test the activation of the duct smoke sensor.
    6. Duct Housing shall provide a magnetic test area and Red sensor status LED.
    7. For maintenance purposes, it shall be possible to clean the duct housing sampling tubes by accessing them through the duct housing front cover.
    8. Each duct smoke sensor shall have a Remote Test Station with an alarm LED and test switch.
    9. Where indicated provide a NEMA 3R, Simplex Part Number 40-98-9845 or equivalent weatherproof duct housing enclosure that shall provide for the circulation of conditioned air around the internally mounted addressable duct sensor housing to maintain the sensor housing at its rated temperature range. The housing shall be ULC Listed.
5. Heat Sensors
    1. Thermal Sensor: Combination fixed-temperature and rate-of-rise unit with plug-in base and alarm indication lamp; 135°F fixed temperature setting except as indicated.
    2. Thermal sensor shall be of the epoxy encapsulated electronic design. It shall be thermistor-based, rate-compensated, self-restoring and shall not be affected by thermal lag.
    3. Sensor fixed temperature sensing shall be independent of rate-of-rise sensing and programmable to operate at 135°F or 155°F. Sensor rate-of-rise temperature detection shall be selectable at the FACP for either 15°F or 20°F per minute.

4. Sensor shall have the capability to be programmed as a utility monitoring device to monitor for temperature extremes in the range from 32°F to 155°F.
5. All heat detectors are to be addressable inherently within the device. If a convectional heat detector must be used, it shall be of the re-settable type with latching red led.
6. Alarm Notification Appliances
  1. Red or white textured UV stabilized, color impregnated engineered plastic. Exceeds 94V-0 UL flammability rating.
  2. Lens Optical grade polycarbonate (clear)
  3. Mounting (indoor only) Strobes and horn-strobes are for wall-mount installation only. Horn-only models may be ceiling- or wall-mounted.
  4. Flush mount: 2½ inch (64 mm) deep one-gang box.
  5. Surface mount: Model 27193 surface mount box, wiremold box, or equivalent surface-mount box. With optional trim plate: One-gang, two-gang, four-inch square, octagonal, or European single-gang box.
  6. Wire connections: Screw terminals: single input for both horn and strobe. #18 to #12 AWG (0.75 mm<sup>2</sup> to 2.5 mm<sup>2</sup>) wire size.
  7. Operating environment: Indoor only: 32-120°F (0-49°C) ambient temperature. 93% relative humidity.
  8. Agency listings/approvals: UL 1971, UL 1638, UL 464, ULC S525, ULC S526. ADA Compliant.
  9. Dimensions (HxWxD): Signal: 4-1/2" x 2-3/4" x 13/16" (113 mm x 68 mm x 21 mm) Trimplate: 5" (127 mm); Height – 5-7/8" (149 mm); Depth – ½" (13 mm)
  10. Operating voltage: G1-HD series temporal-tone horns: non-coded, filtered 16-33 Vdc or unfiltered 16-33 Vdc FWR (or coded when horn set to steady tone) G1-HDVM series temporal-tone horn-strobes: non-coded, filtered 16-33 Vdc or unfiltered 16-33 Vdc FWR (or coded (audible NAC only) when used with optional G1M Genesis Signal Master) G1-VM series strobes: non-coded, filtered 16 - 33 Vdc or unfiltered 16-33 Vdc FWR G1-P series steady-tone horns: coded or non-coded, filtered 20-31 Vdc or unfiltered 20-27 Vfwr.
  11. Strobe output rating: UL 1971, UL 1638, ULC S526: selectable 15 cd, 30 cd, 75 cd, or 110 cd output UL 1971: 15 cd (fixed 15/75 cd models), UL 1638, ULC S526: 75 cd (fixed 15/75 cd models)
  12. Temporal audible pattern: ½ sec ON, ½ sec OFF, ½ sec ON, ½ sec OFF, ½ sec ON, 1½ sec OFF, then repeat cycle or continuous, field selectable or programmable.
2. Raceways and Wiring
  1. Raceways, conduit, and wiring shall be in accordance with Electrical Basic Materials and Methods, as supplemented by the following:
    1. All raceways, conduit and wiring shall conform to applicable standards and codes for emergency systems, and shall be configured as a dedicated system from each electrical distribution system panelboard source.

2. Wiring for audible and visual signal circuits shall be No. 14 AWG minimum. Voltage drop to any signal shall not exceed 10 percent. Wiring for detection circuits shall be No. 16 AWG minimum. Wire resistance shall not exceed 50 Ohms.
  3. Wiring for sprinkler system devices, flow switches and monitor switches where required shall be provided by this trade contractor.
  4. The entire fire alarm installation shall be located in conduit, including new wiring within portions of the existing building whether those portions are being renovated or not. Only existing wiring that is not altered shall escape this requirement.
  5. All conduit shall be concealed and all boxes recessed, including to existing portions of the building, unless drawings specifically note that conduit and boxes may be exposed in the finished Work.
3. Hangers and Support
    1. Products and materials for hangers and support shall be as described in Section 260501 Basic Materials and Methods. Conform to same.
  4. Fire Alarm Equipment
    1. Annunciator Panel: Existing to remain.
    2. Fire Alarm Control Panel: Existing to remain. Make all alterations to existing control panel, to complete the system, as set out on drawings and in schematics.
    3. Passive Graphic Displays: New this contract.
  5. Accessories and Appurtenances
    1. Junction Boxes, Pull Boxes, Cabinets, Identification Materials and Products.
      1. Products and materials for these and other required accessories and appurtenances shall be as described in Section 260501 Basic Materials and Methods. Products and materials shall be identified in the finished work as required by authorities having jurisdiction and applicable standards and codes.
    2. Addressable Circuit Interface Modules
      1. Addressable Circuit Interface Modules: Arrange to monitor or control one or more system components that are not otherwise equipped for addressable communication. Modules shall be used for monitoring of water-flow, valve tamper, non-addressable devices, and for control of AHU systems.
      2. Addressable Circuit Interface Modules will be capable of mounting in a standard electric outlet box. Modules will include cover plates to allow surface or flush mounting. Modules will receive their operating power from the signalling line circuit or a separate two wire pair running from an appropriate power supply, as required.
      3. There shall be the following types of modules:
        1. Type 1: Monitor Circuit Interface Module:

For conventional 2-wire smoke detector and/or contact device monitoring with Class B or Class A wiring supervision. The supervision of the zone wiring will be Class B. The module will communicate status (normal, alarm, trouble) to the FACP.

For conventional 4-wire smoke detector with Class B wiring supervision. The module will provide detector reset capability and over-current power protection for the 4-wire detector. This module will communicate status (normal, alarm, trouble) to the FACP.

2. Type 2: Line Powered Monitor Circuit Interface Module

This type of module is an individually addressable module that has both its power and its communications supplied by the two wire signalling line circuit. It provides location specific addressability to an initiating device by monitoring normally open dry contacts. This module shall have the capability of communicating four zone status conditions (normal, alarm, current limited, trouble) to the FACP.

This module shall provide location specific addressability for up to five initiating devices by monitoring normally closed or normally open dry contact security devices. The module shall communicate four zone status conditions (open, normal, abnormal, and short). The two-wire signalling line circuit shall supply power and communications to the module.

3. Type 3: Single Address Multi-Point Interface Modules

This multipoint module, shall provide location specific addressability for four initiating circuits and control two output relays from a single address. Inputs shall provide supervised monitoring of normally open, dry contacts and be capable of communicating four zone status conditions (normal, open, current limited, and short). The input circuits and output relay operation shall be controlled independently and disabled separately.

This dual point module shall provide a supervised multi-state input and a relay output, using a single address. The input shall provide supervised monitoring of two normally open, dry contacts with a single point and be capable of communicating four zone status conditions (normal, open, current limited, and short). The two-wire signalling line circuit shall supply power and communications to the module.

This dual point module shall monitor an unsupervised normally open, dry contact with one point and control and output relay with the other point, using a single address. The two-wire signalling line circuit shall supply power and communications to the module.

4. Type 4: Line Powered Control Circuit Interface Module

This module shall provide control and status tracking of a Form "C" contact. The two-wire signalling line circuit shall supply power and communications to the module.

5. Type 5: 4-20 mA Analog Monitor Circuit Interface Module

This module shall communicate the status of a compatible 4-20 mA sensor to the FACP. The FACP shall annunciate up to three threshold levels, each with custom action message; display and archive actual sensor analog levels; and permit sensor calibration date recording.

4. All Circuit Interface Modules shall be supervised and uniquely identified by the control unit. Module identification shall be transmitted to the control unit for processing according to the program instructions. Modules shall have an on-board LED to provide an indication that the module is powered and communicating with the FACP. The LEDs shall provide a troubleshooting aid since the LED blinks on poll whenever the peripheral is powered and communicating.

5. Isolators, shall be installed as per ULC at all zone boundaries. Isolators shall be easily accessible below ceilings for annual inspection. Where applicable, devices with integral isolators in base may be used.
6. External Connections
  1. Materials for external connections shall be in accordance with 260500 and 260501, and:
    1. All wiring shall be provided in conduit unless specifically noted otherwise.
    2. Monitoring and notification and any existing connections to Owner's security system shall remain.
    3. Connections to existing gas shutdowns, kitchen ventilation fire suppression systems, and other elements of the existing Fire Detection and Alarm System shall remain. Reverify if required by authorities having jurisdiction or by Code or Regulation set out in this specification.

### 3. EXECUTION

1. Preparation
  1. Prior to site mobilization, perform all general work and services required by Part 1 and Sections 260500 and 260501 to ensure acceptance of electrical design, products, and proposed execution.
  2. Prior to installation, on site, lay out ALL exposed lines and device locations for Consultant's acceptance, and also concealed lines wherever conflict can occur. Revise lines and device locations as directed by Consultant.
  3. Perform work to alter system in a manner that minimizes system downtime.
  4. Take portions of the system out of order only after alerting Owner and monitoring agency with minimum 48 hours notice and obtaining Owner's acceptance of proposed shutdown.
2. Selective Demolition
  1. Disconnect, CAREFULLY remove and relocate existing equipment, fixtures, etc. as shown or required. Cap conduit inside walls or ceilings in workmanlike manner. Remove discontinued wiring to panel unless written permission of Consultant is received to disconnect and identify wiring for future use.
  2. Disconnected wiring shall be fully removed from panels and similar equipment and devices that remain in the finished Work. Do not leave loose wires in panels.
3. General Installation
  1. Installation of raceways and wiring shall conform to the Electrical General requirements and Electrical Basic Materials and Methods, and the following additional requirements.
  2. Location of equipment, devices and lines shall be neat, in consistent relation to the building structural system rhythm and the requirements of architectural layouts. Location of all devices must conform with requirements for Barrier-Free Path of Travel System.
  3. Verify fully all existing systems as required to ensure proper operation of all new devices, equipment and new system capacity. Also clean and adjust existing systems to full extent for full operation of new portions of system to be installed.

4. Comply with the Ontario Building Code, except that where such Code references regulations and standards this Contract requires installation to the latest issued amendments and supplements of such regulations and standards. Conform to the most stringent requirement in each case, for all new work.
  5. Connect adjacent signals on different and alternating circuits. Make any modifications to existing wiring as required.
  6. Conductors entering the control panel shall be identified and terminated on individual terminals.
  7. Conductors shall be connected in accordance with manufacturer's wiring diagram and run in conduit throughout.
  8. Wiring must be cut at each automatic and manual station and device, and connected to the four terminals provided on the unit. (These connections ensure supervision of the circuit. Looping of the wires under terminal screw is not permissible). All wiring shall be continuous between control panel, detectors, stations and signals. Splices where permitted by the Consultant shall comprise soldered joints.
  9. Install resistor for signal circuit in a suitable box adjacent to the last signal of the signal circuit; if diodes are used, install in the outlet box of the last signal of the signal circuit and indicate on signal. End-of-line resistors for station circuits shall be mounted in flush box, maximum of 6 feet above floor beyond last device on circuit.
  10. Mount detectors on ceiling as per ULC standard CAN/ULC-S524-14 unless otherwise specified herein, at the highest point where variations in ceiling height exist. Do not mount detectors on sides, undersides, or less than 12" (300 mm) from beams, joists, open web steel joists or any structure projecting below actual ceiling height.
  11. Should interference from obstruction, lamp positions or heat radiating surfaces be encountered in locating any detector where shown, locate the detector as near as possible to the indicated position, clear of obstacles, to the satisfaction of the Consultant.
  12. Identify signal circuit, box circuit, auxiliary circuit, wiring at fire alarm control panel, annunciator, terminal boxes or elsewhere on completion of work.
4. Fire Alarm Devices
    1. Execution for fire alarm devices shall be as above and additionally as described in Section 260501 Basic Materials and Methods, and to meet reference codes and standards.
  5. Raceways and Wiring
    1. Execution for raceways and wiring shall be as described in Section 260501 Basic Materials and Methods, but shall additionally conform to the requirements of standards and codes and this Section.
  6. Hangers and Support
    1. See 260501 and conform thereto, except that hanger and support work must additionally conform to requirements stated in reference standards and codes. Support conduit, equipment, devices, and accessories independently of ganged raceways or trays to permit disconnection and removal without disruption of raceway system. Design and locate connections to permit easy removal of same with minimum removal of raceways.
  7. Fire Alarm Equipment
    1. Modify existing panel as required to accommodate changes and the intent of the new completed system. Modify the annunciator to suit any changes to the system configuration.

8. Accessories and Appurtenances
  1. Execution requirements for accessories and appurtenances shall be as described in Section 260501 Basic Materials and Methods.
9. External Connections
  1. Connections to electrical distribution system shall be the existing power connection from the Fire Alarm Control Panel only, with circuits locked.
  2. The Fire Detection and Alarm System is a subsystem of the Emergency Egress System, and this Contract requires co-ordination and co-operation among trade contractors and the Contractor to achieve the intent of that system.
  3. Provide wiring connection and relays to any automatic entries, including conduit and wiring to each location and further within the door head using concealed means through window and entry framing only. Final connection of wiring from relay to auto door controls is provided by the auto door trade contractor.
  4. Provide wiring connection and relays to any door hold-open or electro-magnetic locking devices at building doors, including conduit and wiring to each location and further within the door head using concealed means through frames, window and entry framing only. Final connection of wiring from relay to door hardware is provided by the door trade contractor. Final connection to mag lock and provision of signage, release buttons, and other portions of the device shall be provided by this trade contractor.
  5. Retain connections to gas distribution system shutdown valves, including conduit and wiring to each location, including verifications of the valve operation upon signal if re-verification is required by authorities.
  6. Make connection to all hvac units where scheduled or indicated on drawings, including but not limited to fans, air handling units, rooftop packaged units, ERV's, including conduit and wiring to each location, including verification that the item control upon signal actually performs the intended action for the HVAC system upon emergency. Simple confirmation of production of signal is not sufficient, and this trade contractor and the HVAC trade contractor shall co-operate and perform all services to verify the intended sequence of operations. Provide a duct sensor in each return duct that is part of an hvac system serving more than one fire compartment, and wire and connect each sensor to the Fire Detection and Alarm System, whether shown on drawings or not, without additional cost to the Owner.
  7. Make connection to the Building Monitoring System at the Fire Alarm Control Panel and at the Annunciator if required. Conduit and wiring to each panel location shall be provided by the Building Monitoring System Trade Contractor.
  8. Ensure and verify connection to Fire Alarm control panel by the existing telecom system, and provide for all communication required by the Fire Detection and Alarm System through the existing communication systems to Fire Department and/or alarm monitoring agency.
10. Instructions to Operator
  1. Instruct Owner's Building Operator in care, maintenance and operation of the Fire Detection and Alarm System and its components and relations to other systems. See 260500 and 260501 for further detail.
11. Testing and Commissioning
  1. Test and commission the Fire Detection and Alarm System in its final revised form in accordance with the prescribed requirements of Division 1 and this Section.

2. Operate all systems to full capacity and verify proper, safe, efficient function of all components and of each complete system.
3. Test batteries to requirements of this Section, applicable standards and codes, and satisfaction of authorities, regardless of whether existing or new.
4. Provide services during and after installation as set out in Part 1, and as follows:
  1. Retain the services of the manufacturer of the original equipment and system for this Facility to provide Special Commissioning "Verification, Inspection and Certification" and to supervise the connection, initial test and adjustment of the system throughout new alterations and the existing building. The verification shall be done to suit code and Local Authorities requirements.
  2. Verification procedure shall comply with ULC standard CAN/ULC-S537-13 and shall include providing proper functioning and connection of each device and function of the systems unless authorities accept partial verification. Furnish upon completion of the work, a letter from the manufacturer as evidence that such tests and instruction have been performed to their satisfaction, and additionally to indicate that:
    1. System complies with manufacturer's installation recommendations, ULC requirements, and specified operation.
    2. Installation is acceptable for Warranty.
    3. Completed system complies with regulations concerning supervision of functions, signals, stations, and automatic detectors.
    4. All sequences of operation for other Building Systems that are initiated or dependent upon the actions of the Fire Detection and Alarm System have been verified and witnessed by the individual performing the Fire Detection and Alarm System verification.
5. Inspection Certification
  1. Retain services of the fire alarm manufacturer's representative to provide the following documents:
    1. A copy of the inspection Technician's report showing location of each device, and certifying the test results of each device.
    2. A Certificate of Verification confirming that the inspection has been completed and showing the conditions upon which such inspection and certification have been rendered.
    3. Proof of liability insurance for the inspection firm.
    4. Audibility level plots in the areas, where requested by Consultant or Owner.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated herein.

### 2. Related Requirements

- |                          |                |
|--------------------------|----------------|
| 1. Existing Conditions   | Section 002000 |
| 2. Temporary Facilities  | Section 015010 |
| 3. Temporary Controls    | Section 015020 |
| 4. Selective Demolition  | Section 024119 |
| 5. Excavations and Fills | Section 321300 |
| 6. Unit Pavers           | Section 321400 |

### 3. Existing Conditions

1. Contractor shall thoroughly review the Existing Conditions and reference documents. Incorporate all Existing Conditions reasonably inferable from an examination of the site, existing buildings, existing conditions, and reference documents into the Contract Price, the Time for Completion of the Work, and the design of ways and means for the accomplishment of the Work in accordance with the Contract Documents.
2. Known underground and surface utility lines and buried objects are as indicated on reference documents, site plan and as discussed at the Bidder's Site Meeting with the Owner's representative. Perform work of this Section with due care for the presence of known and unknown conditions. Provide private utility locates at no cost to Owner.
3. Provide any required dewatering to accomplish the Work, without cost to Owner. Ensure that surfaces, excavations, and areas affected by the Work are protected from freezing water by immediate dewatering.
4. Co-ordinate grading work with required excavations for structures and services, and with existing structures and services. Proceed with caution when excavating over or near existing conditions.
5. Inform Consultant and Owner immediately should subsurface conditions vary from assumptions implicit in the design or as reasonably inferable from the reference documents. Consultant will determine course of action, and any requirement for a change to the Work. Testing and Inspections firm does not have authority to make Changes in the Work that affect Contract Price or Contract Time. Commencement of work to areas at variance implies acceptance of the conditions by the Contractor, without change to Contract Price or Time.
6. Protect existing surface finishes, trees and planting which shall remain in the finished work in accordance details on drawings and with Division 1 requirements.
7. All grading shall be accomplished in accordance with construction sequencing and construction planning to maintain Owner's use of the property and facilities and in accordance with the required sequencing of the Work.
8. Where the differences between existing and finished grades can be demonstrated by either the Owner or the Contractor (as the case may be) as varying significantly from the reference information and existing topographic survey provided by the Owner as part of the bid documents and reference documents, the cost of such variances shall be adjusted using the Contract Unit rates or by direct negotiation of a change in the Work.

4. Reference Standards and Codes

1. ASTM D698-00a<sup>1</sup>, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m<sup>3</sup>).
2. All grading operations shall conform to recommendations of Ministry of Labour and Ministry of Environment Conservation and Parks regulations. This includes requirements for soils testing prior to removal from property. All such tests shall be performed and paid for by the Contractor and/or Siteworks Trade Contractor.

6. Environmental Conditions

1. Do not perform compaction of native subgrades or fills when soil is frozen or wet.
2. Do not perform removal of soils from the property when environmental conditions promote mud and tracking of dust and sediment to other areas of the Owner's property or public rights-of-way. Remove all mud and tracking of dust as directed by the Owner. All such costs are included in the Contract Price.

7. Identification of Building Systems

1. The work described by this Section is related to the following Building Systems as defined in Section 019010. Comply with requirements for performance, review, and coordination of such systems:
  1. Site Grading and Drainage Systems
  2. Barrier-Free Path of Travel System

## 2. PRODUCTS

1. Materials

1. Fill materials: in accordance with of Section 312300 - Excavating, Trenching and Backfilling, including fills for Engineered Fill work where required by documentation.
2. Excavated or graded material existing on site may be used as fill for grading work to top of subgrade only. Granular base and subbase material excavated below existing hard surface areas may be used for fill work to underside of new hard surface subbase profiles only where tests show the SAR content of the material to be within 4 times allowable limit for MOE Table 1. Contractor and Siteworks Trade Contractor are deemed have fully reviewed the Reference Documents by the act of submitting a bid for the Work. Existing subbase and base material may not be used for fill under planting bed areas or soft landscaping areas All subbase and base courses below new hard site surface finishes in the Work must be new material.
3. No stripped topsoil may be reused in the Project or the Work. Topsoil under all areas of new plantings shall be new, imported material. Dispose of existing material and pay all costs, including costs of testing to MECP requirements for removal of soils from Owner's property.
4. No stripped bedding sands and joint sands may be reused in the Project or Work. Bedding sands under all areas of new or modified unit pavers shall be new, imported material. Dispose existing material and pay all costs.
5. Inspect all material used to form new grades at times and in duration sufficient to determine material suitability for such use, and provide log report to Consultant. The Owner's Inspection and Testing geotechnical forces, and the Inspection Cash Allowance, are for the Owner's quality control purposes only. See notation above regarding SAR content of existing bases and subbases under existing roadway and vehicle areas of the site, and requirements for payment of soils testing for soils to be removed from the Property.

### 3. EXECUTION

#### 1. Temporary Protection

1. Ensure that temporary protection measures including tree protection, siltation control, and site entrance mud mat are in place and accepted by both Owner and Authorities having jurisdiction prior to performing site grading operations.

#### 2. Stripping of Topsoil

1. Remove landscape finishes as necessary for the work and dispose offsite. Arrange for testing and pay all costs for tests and analysis. Pay all costs for disposal.

#### 3. Grading

1. Rough grade to levels, profiles, and contours allowing for surface treatment as indicated, and to form complete and functioning Site Grading and Drainage System that ensures positive drainage performance carrying water away from structures and to patterns anticipated by the Grading and Drainage Plan. Marry grades at perimeter of work area to existing grades, taking care to calculate depths of finished fill and topsoils. Ensure that drainage patterns flow continuously from existing areas to new, for best performance of drainage in the finished Work.
3. Rough grade existing granular and native soils to following depths below new finish grades. The depths are from compacted finished subgrade, once subgrade has been proofrolled and compacted such that soft spots are removed and filled with compacted material:
  1. for areas to receive topsoil, 150mm (6");
  2. for areas to receive planting beds, 450mm (18");
  3. for areas to receive base and exterior concrete walks, 300mm (12").
4. Slope rough grades and sub-grades away from building sites 1:50 minimum, unless specifically notes otherwise on the Grading and Drainage Plan.
5. Grade swales to depths required to accomplish the performance of the Grading and Drainage System once subbases, bases, and finish materials are installed.
6. Prior to placing fill over existing ground, scarify surface to depth of 3" (75 mm). Maintain fill and existing surface at approximately same moisture content to facilitate bonding.
7. Compact filled and disturbed areas to SMPDD to ASTM D698, as follows:
  1. 100% under structural foundation areas, and to all levels below footings throughout the building footprint and beyond;
  2. 98% under hard surface paving, granular surface finishes, and slabs-on-grade;;
  3. 90% under landscaped areas.
8. Do not disturb soil within branch spread of trees or shrubs to remain, for any reason. Adhere strictly to requirements for Temporary Protection of Trees and Shrubs.
9. Supply any excess fill required to achieve new subgrades, at no cost to Owner.
10. All subgrade profiles at completion of grading must drain in accordance with the pattern of drainage of finished surface drainage system, except for variances in thickness of finish layers.

#### 8. Testing

1. Inspection and testing of soil compaction for the Owner's own quality control purposes will be carried out by inspection firm designated by the Owner except as noted herein for disposal or re-use of site materials. The Owner shall pay costs of tests under a Cash Allowance. Refer to Division 1.

2. Contractor must undertake independent quality control to ensure compliance that the requirements of the Contract are being met, where the Contractor may have any uncertainty regarding such compliance. The Contractor shall pay costs of any testing as it deems necessary to confirm compliance. The Contractor and/or the Siteworks Trade Contractor shall arrange for and pay for all sampling, testing, and analysis of soils that are being removed from site and disposed, in accordance with MECP regulations.
9. Surplus Material
  1. Remove surplus and unsuitable material for fill or grading. Stockpile to locations accepted by Consultant. Pay all costs for temporary transport, placement, and shaping to prevent erosion.
10. Disposal of Surplus Material after Testing
  1. Upon completion of soils testing and analysis by the Contractor, remove surplus material and material unsuitable for fill or grading and dispose at acceptable locations. Pay all costs for transfer, transport, and disposal, including any required permits. Haulage operations shall use appropriate flag persons and traffic management to ensure the safety of users and the public, all at Contractor's own cost.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated herein.
2. Caution. All work to excavation, haulage, backfill, compaction, and other site operations must use means and equipment that will not damage existing finishes and surfaces or the building. The Contractor shall be responsible for repairing damage to roadways and surfaces, cracking of masonry, etc., where such damage is the result of the performance of the Work.
3. All work must comply with the Reference Documents, including the Plans and Reports for the management of Source Groundwater and its protection.

### 2. Related Requirements

- |  |                                  |
|--|----------------------------------|
| 1. Reference Documents and Existing Conditions         | Section 002000                   |
| 2. Special Project Requirements                        | Section 011010                   |
| 3. Work to Existing                                    | Section 011030                   |
| 4. Construction Schedules and Sequence of Construction | Section 013020                   |
| 5. Temporary Utilities, Controls, and Facilities       | Sections 015010, -033, -034      |
| 6. Building Structural System                          | Section 019550                   |
| 7. Selective Demolition and Cleaning                   | Section 024119                   |
| 8. Site Grading and Surface Drainage System            | Section 312200                   |
| 9. Exterior Improvements                               | Division 32                      |
| 10. Building mechanical and electrical                 | Divisions 20, 22, 23, 26, 27, 28 |

### 3. Definitions

1. *Unsuitable materials* is hereby defined as the following:
  1. Weak and compressible materials under excavated or graded areas.
  2. Frost susceptible materials under exterior excavated or graded areas.
  3. Materials that do not have moisture content properties at time of placement within acceptable ranges from optimum, or otherwise unacceptable to the geotechnical inspection firm and the Reference Documentation. Note that existing bases, subbases, existing fills and existing native material as determined from Geotechnical Report is such that re-use of such material will not be allowed. All material shall be imported new, unless procedures as outlined in Section 312200 are followed and an adjustment to the Contract is made in accordance with such procedures.

Under no circumstances shall existing materials be used as fill within the building footprint or in the zone of influence of the building foundations.

In general, all backfill, engineered fill, and fill below building structural foundations in the zone of influence of such foundations, to span from new foundation bottom of footing level to levels of competent native undisturbed soil, shall be lean concrete.

2. Findings with respect to unsuitable materials shall rest with the Owner's Testing and Inspection Firm as confirmed by the Consultant. Comply with such findings in performance of the Work.

### 4. Work Related to Existing

1. Protection of Existing Features

Excavating, Trenching and Backfilling, Fills

1. Protect existing building structures, features, trees, and areas to remain, all in accordance with Division 1 requirements, requirements for erosion and soil protection, and tree and shrub protection.
  2. For excavation below existing slabs for new services, protect adjacent portions of the Facility and the Work. Do not overload slab areas with excavated material and protect such areas from damage by Construction Equipment and excavated material.
  3. Under no circumstances shall excavating, trenching or similar work be undertaken such that it undermines existing structure of the Facility or new construction. Do not undertake soils operations where there is risk of such occurrence, including where risk may arise from exposure of existing structural foundations and walls or newly constructed structure to frost, rain or accumulated water, impact, vibration, or other measure that may alter the existing soils or support for structure.
2. Site Conditions
1. Examine existing conditions and Reference Documents, including any geotechnical information and hydrogeological information. Contractor shall incorporate all Existing Conditions reasonably inferable from an examination of the site, existing building, existing services, Existing Conditions, and Reference Documents into the Contract Price, the Time for Completion of the Work, and the design of ways and means for the accomplishment of the Work in accordance with the Contract Documents.
  2. Known underground and surface utility and underslab service lines and buried objects are as indicated on Reference Documents, site plan and as discussed at the Bidder's Site Meeting with the Owner's representative. Perform work of this section with due care for the presence of unknown services. Neither Owner nor Consultant warrant the accuracy of such information.
  3. Provide any required temporary drainage system, storm water management system, and dewatering to accomplish work described by this Section, at no cost to Owner. All drainage to existing storm sewerage systems must be accomplished through proper sedimentation control structures, including backup redundancy, acceptable to Consultant and authorities having jurisdiction. This contract requires installation of a complete temporary overland flow storm system to re-route major storm water from entering the excavations and immediate area of the existing building. Establish this system prior to beginning excavation work and maintain throughout the course of the Work until all subgrades are re-established to new profiles.
  4. Inform Consultant and Owner immediately should subsurface conditions vary from assumptions implicit in the design. Consultant will determine course of action, and any requirement for a change to the Work. Testing and Inspections firm or geotechnical engineer does not have authority to make Changes in the Work that affect Contract Price or Contract Time.
5. Submittals
1. Submit in accordance with Division 1 requirements:
    1. Name of supplier and pit location for materials for work described by this section.
    2. Project storm water management plan for all areas under the control of the Contractor at each stage in the Work, including routing of existing roof rainwater leaders and management of all potential storm water that may affect the Place of the Work.
    3. Frost protection plan for continuous protection of existing and new footings and foundations from frost penetrations and the actions of frost.

6. Co-ordination

1. Co-ordinate trenching and backfilling work with scheduling of site service system installation and Selective Demolition (Section 024119) work, to minimise periods of open trenching.
2. Co-ordinate trenching and backfilling work to accommodate several services wherever possible, with due regard for required separations between services, depths, and future contingencies for repairs.
3. Co-ordinate backfilling of trenches and services with patterns of drainage for subgrade drainage system, to ensure that backfill with free draining material does not create perching of water in and around services, and that all such locations have gravity outlet to areas of free-draining bases and subbase material. Where this is not possible, install subdrains to provide relief from perched condition as part of the work of this Contract.
4. Form trenching bottom of trench profiles to flow outward from building footprint and perimeter. Groundwater conditions and native material are such that all trenching in native material must be sloped to drain away from building, even when bedding and system pipe components are laid flat. Coordinate this work by pre-installation conference with Consultant.

7. Reference Standards and Codes

1. Standard industry methods for testing of soil composition, compaction, and characteristics in accordance with ASTM and similar standards acceptable to the Owner's Testing and Inspection Firm shall be used in evaluating the work of this Section.
2. The requirements of OPSS 1001, 1004, and 1010 shall apply to this Section. Conform with these at a minimum, and to further requirements as set out herein.
3. ASTM698-00ae1, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN/m<sup>3</sup>).

8. Quality Control

1. Perform all quality control requirements as described in Division 1. Use Construction equipment within the existing Facility that will not damage existing slabs or conditions.
2. Owner may retain the services of a testing and inspection firm of its own choosing to confirm achievement of Contract Requirements. Costs for this work will be paid from a cash allowance as indicated in Division 1.
3. Contractor shall not rely upon Owner's testing and inspection, but shall perform all additional tests in the case of Contractor's uncertainty, at its own expense, to ensure that Contract requirements are achieved.

9. Temporary Facilities

1. Protection of Site

1. Provide cleaning to all roadways affected by haulage and install protective measures to drainage catch basins (silt sacks), mud mats at all construction entrances, and erosion and sedimentation control fencing. Perform this work PRIOR to commencing other operations on the site.
2. Perform locates and x-ray or GPR of slabs at Contractor's expense to locate all underground and underslab services and lines prior to beginning cutting or excavation work.
3. Restrict delivery and haulage to routes designated in Reference Documentation and Sequence of Construction planning requirements.

2. Protection of Excavations

1. Protect sides of excavations from collapse in accordance with OHSA standards and codes having jurisdiction. Take special care for excavations likely to be open during rains or over weekends. Should bearing surfaces be found by the Consultant to be unsuitable because of freezing, weathering, flooding or other damage caused by Contractor's failure to dewater and protect, extend foundations to new approved levels at no cost to Owner. Pay all costs for re-design of foundations to such new levels.
2. Provide temporary re-routing of existing rain water leaders and site storm services to ensure excavations do not receive excess water from these existing or partially installed elements of the surface drainage or storm drainage system.
3. Protect existing foundations and services from damage from frost.

10. Basic Execution Requirements

1. Do not place fill when temperature is at or below 0° C, nor while either fill material or subgrade is frozen.
2. Do not stockpile material onsite without permission of Owner.

11. Identification of Building Systems

1. The work described by this Section is related to the following Building Systems as defined in Section 019010. Comply with requirements for performance, review, and co-ordination of such systems:
  1. Site Grading and Drainage System (both finished grade and at subgrade levels)
  2. Erosion and Sedimentation Control Systems (Divisions 1)
  3. Building Structural System (Section 019550)
  4. Building Storm Drainage System
  5. Building Mechanical Systems (Divisions 20 through 23 inclusive)
  6. Electrical Distribution System (Division 26)
  7. Communication Systems (Division 27)
  8. Site Utilities and Services Systems
  10. Subdrainage Systems

## 2. PRODUCTS

1. Materials

1. Type 1 fill: imported, clean, hard, durable aggregate free of shale, clay, organic matter or other deleterious substances: Granular 'B' to OPSS Form 1010 but not to have stones larger than 2" (50mm) in diameter. For this Contract the material shall consist of new imported material. Existing native, existing base and existing subbase material may not be re-used as fill or as Engineered Fill. For this Contract the existing base courses under asphalt removed in the Work shall not qualify for re-use as Granular 'A' or 'B' without the express acceptance of the Consultant and a credit change to the Contract Price. Provide new material.
2. Type 2 fill (not 'Engineered Fill Type 2' which is described below): imported, clean, hard, durable aggregate free of shale, clay, organic matter or other deleterious substances: Granular 'A' to OPSS Form 1010 but not to have stones larger than 1" (25mm) in diameter.
3. Type 3 fill: imported clean graded sands to OPSD granular 'C' or 'D', free of organic and deleterious matter, for use in below grade and slab pipe bedding and elsewhere as indicated on drawings or in specifications.

4. Type 4 fill: selected clean, native soil, bases, and subbases excavated on this site, capable of being compacted to the required density, acceptable to independent inspection and testing firm and Consultant for use as fill to new subgrade levels, free of roots, debris, stones larger than 2" (50mm) in diameter, and free of organic and deleterious matter. For this contract all material excavated below existing hard surfaces shall be disposed of offsite, and shall not be re-installed in the Work except under exterior areas with soft landscape finishes (sod and planting areas only). Dispose of excess. Further excavated material shall be disposed offsite at Contractor expense.
  5. Type 5 fill: 3/4" (19mm) clear crushed stone manufactured from rock or concrete crushing, no fines, of consistent size and with angular edges only, capable of self-locking compaction. Rounded river stone or pit run gravel with majority rounded edges is not acceptable.
  6. Type 6 fill: onsite excavated granular base material. Mix must be acceptable to independent inspection and testing firm and Consultant for use as subgrade material.
  7. Type 7 fill: 2" (50mm) clear crushed stone manufactured from rock or concrete crushing, screened with 100% passing 2", less than 10% passing 3/4", no fines.
  8. Type 8 fill: rip-rap, crushed reclaimed crushed concrete to acceptance of Consultant to form slope protection, storm water management erosion control and protection, and elsewhere as indicated on drawings or specifications. All concrete removed during select demolition shall be delivered to a local facility for recycling. Pay all costs for removal and disposal, and all costs for supply of reclaimed material. Onsite crushing operations are not permitted.
2. Moisture Content
    1. Moisture content of fills shall be within 2% of the ASTM Optimum Moisture Density (ASTM D698) for each material blend.

### 3. EXECUTION

1. Site Preparation - Not applicable this Project.
2. Stockpiling - Not applicable this Project.
3. Dewatering and Heave Prevention
  1. Keep excavations free of water while work is in progress. The Contractor is cautioned that no additional cost will be considered for dewatering necessitated by:
    1. Conditions that can reasonably be foreseen from examination of any combination of the design, Reference Documents, Existing Conditions,
    2. Conditions caused by temporary changes to storm drainage patterns, absorption characteristics of exposed grades, work adjacent existing storm piping or rain water leaders from buildings, or similar patterns of storm run-off during construction or from areas adjacent the construction area, prior to commissioning of the finished storm drainage system at acceptance of the Work,
    3. Conditions caused by rainfall, flooding of adjacent waterways, or other conditions that are normal climatic and major atmospheric events that can be reasonably anticipated by the inspection of the Place of the Work and climatic data referenced in Section 002000, to the hundred year storm.
  2. Avoid excavation below groundwater table if quick condition or heave is likely to occur. Prevent piping or bottom heave of excavations by groundwater lowering or other means. See borehole results of Geotechnical Report and the Hydrogeological Report for depth of groundwater. Do this work in accordance with Source Groundwater Protection Plan.

3. Protect existing facilities, the property, and open excavations against flooding and damage caused by surface run-off or subsurface groundwater flow.
  4. Dispose of water in strict accordance with Division 1 requirements, through filtered means. Disposal into adjacent waterways may require permits from authorities. Apply for, obtain, and pay for all such permits at Contractor expense. It is anticipated that the existing storm water management system within the area of the building addition, which collects roof rain water and surface water and routes it to an existing storm sewerage system, shall remain and shall be maintained (including protection against siltation) throughout the Contract Time until new systems are commissioned.
4. Excavation and Engineered Fill and Lean Concrete Work
1. Do all excavation required for work of this Contract, unless it is clearly described in other Sections as integral to the work described in that Section. Schedule such work for completion of all required excavation and backfilling that relates to each portions of construction in the required sequence of construction, as separate mobilizations that are designed to support the efficient accomplishment of the Work and Interim Milestones. Perform excavation work AFTER site grading has been completed to establish the finished subgrade drainage profile, and BEFORE installation of any subbase, base course, or surface finish.
  2. Excavate to lines, grades, elevations and dimensions required for the finished Work, and for the performance and requirements of:
    1. Site Grading and Surface Drainage System to depths for its components, including, subgrade, subbases and bases;
    2. Site Servicing Systems either existing or new;
    3. Level entry at building entries;
  3. Take precautions when excavating adjacent to buried services; use hand tools only in locating services less than 1'-0" (300mm) in diameter.
  4. Excavation must not interfere with normal splay of bearing from bottom of any existing footing, site structure, or pipe bed, as judged from the soils conditions encountered or likely to be encountered. Where such interference may be encountered, provide shoring and concrete underpinning, or excavate using alternative methods reviewed and accepted by the Owner's geotechnical inspection firm as confirmed by the Consultant. Pay all costs for this work where it may reasonably be inferred from the design and /or the reference documentation identified in Section 002000.
  5. For trench excavation, unless otherwise authorized by Owner in writing, do not excavate more than 50' (15 m) of trench in advance of installation operations and do not leave open more than 16' (5 m) at end of day's operation. Do not expose excavations to potential storm events. Provide temporary drainage patterns to ensure this protection, by temporarily altering grades to suit protection requirements.
  6. Dispose of all excavated material off the Owner's property at no cost to Owner unless otherwise noted. This work includes all permits and procedures for disposal in accordance with the nature of the material as identified in the Reference Documentation.
  7. Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.
  8. Obtain testing and inspection firm's approval of completed portions of excavations as set out above.
  9. Remove unsuitable material from trench bottom to extent and depth as directed by Testing and Inspection firm.

10. Perform excavations for service piping or conduits in strict accordance with requirements for performance of such Building Systems, and under the direction of the trades concerned.
11. Correct unauthorized over-excavation as follows:
  1. Fill under bearing foundations and retaining walls by installing lean concrete of larger thickness or imported granular Type 1 fill compacted to 100% SPMDD under the continuous supervision of the Owner's nominated Geotechnical firm. Pay all costs for this supervision and follow all instructions from such firm.
  2. Fill under other bearing areas, hard surface landscaped areas, asphalt areas and pathways with Type 1 fill compacted to not less than 98% of SPMDD density.
  3. Fill under other areas with Type 1 fill compacted to 90% of corrected maximum dry density.
12. Hand trim, make firm and remove loose material and debris from sides of excavations.
13. If the removal of earth causes displacement of adjacent earth, remove the earth so disturbed at no additional cost to the Owner.
14. Co-ordinate excavation with measures for protection of existing building foundations and services from frost action. Ensure positive drainage of temporary storm water management system at all times during and after the excavation operations.
5. Soil Bearing Remediation
  1. Review existing conditions and all reference information as identified in Section 002000.
  2. Notify Consultant and Testing and Inspection Firm when bottom of excavation is reached.
6. Bedding and Surround of Underground Services
  1. Place and compact sand and granular material for bedding and surround of underground services and underground drainage as indicated and as specified for service installation work. Meet all OPSS referenced requirements and the Contract Documents, whichever is stricter, for each installation.
  2. Place bedding and surround material in unfrozen condition, free of all rocks greater than 2" (50mm) in diameter.
  3. Install backfill to facilitate smooth and level installation of rigid insulation to piping where indicated or required by lack of frost cover.
  4. Do not proceed to backfill underground services at crossing locations until reviewed and accepted by both the Consultant and Owner's representative.
  5. Co-ordinate backfill and bedding with subgrade profile of silty clay to ensure backfilled areas do not create perched water conditions within excavated areas.
7. Backfilling
  1. Do not proceed with backfilling operations until Consultant has reviewed and accepted installations that will be covered. Ensure no perched water conditions within subgrade.
  2. Areas to be backfilled shall be free from debris, snow, ice, water and frozen ground.
  3. Do not use backfill material that is frozen or contains ice, snow or debris.

4. Place backfill material in uniform layers not exceeding 8" (200mm) compacted thickness up to required subgrades indicated and for performance of Building Systems. Compact each layer before placing succeeding layer.
  5. Ensure profiles of each type of compacted fill correspond with profiles of finished grade, complete with percolation routes to established points of drainage, to ensure proper drainage within the soil structure.
  6. Subgrade profiles adjacent building foundations must be positively sloped away from the building, to ensure sub-drainage drains away from building.
8. Restoration
1. Upon completion of work, remove waste materials and debris, trim slopes, and correct defects as required to ensure Contract requirements are met.
9. Corrections
1. Remove and replace fill until compaction and work is satisfactory to the Consultant and the Testing and Inspection geotechnical engineering firm. Pay all costs for this remedial work.
  2. Leave site clean and tidy each day. Clean all access routes with sufficient frequency to ensure dust and tracking of materials is eliminated, at no cost to Owner. Make good all damage from equipment and machinery to existing surfaces, including curbs, paved surfaces, soft landscaped areas and roadways, at no cost to Owner.
10. Cost of Owner's Testing and Inspection, and Consultant Review
1. Owner shall pay costs from Cash Allowance for continuous presence of geotechnical testing and inspection firm representative, or reviewing Consultant representative, only during times where placement work for lean concrete, engineered fill, and other fills is proceeding efficiently. Contractor pays all costs for representatives where their presence is requested by the Contractor or necessitated by the Owner's Quality Control procedures and work is not being performed, regardless of reason.
  2. For site inspections by Owner's Geotechnical testing and inspection firm, and for reviews by Consultant, Owner shall pay costs from Cash Allowance or Consultant Contract only for a 2 hour duration of visit for test or inspection. Further presence and waiting for commencement of work to be tested, or requested presence falsely claiming that work is ready for testing, inspection, or review, where caused howsoever, shall be paid by the Contractor through an offsetting change credit to the Contract Price.

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated here.
2. Note that precast unit pavers to rooftops are separately described in Section 077200.

### 2. Related Sections

- |  |                |
|--|----------------|
| 1. Work to Existing Building             | Section 011030 |
| 2. Demolition and Removals               | Section 024119 |
| 3. Site Grading & Drainage System        | Section 312200 |
| 4. Excavation, Trenching and Backfilling | Section 312300 |

### 3. Items Described by this Section

1. Work to provide all modifications to existing precast concrete unit paving finishes to exterior surfaces where indicated includes, but is not limited to the following:
  1. Concrete Paver Units
  2. Bedding and Joint sands
  3. Cleaners, Sealers and Joint Stabilizers
  4. Geo-textile Fabrics
  5. Granular Base course

### 4. Construction Schedules

1. Perform the work of this section in strict conformance with the construction sequencing. Coordinate unit paver work with retaining walls and all other exterior items.

### 5. Submittals

1. Submit in accordance with Division 1 requirements:
  1. Duplicate samples of finishes for confirmation of colours and finishes by Consultant. Submit alongside existing to show colour match.
  2. Shop drawings showing design and detailing of units. Include all information regarding product drawings and product data for confirmation by Consultant prior to fabrication.
  3. The layout, pattern, and relationship of paving joints to fixtures and project formed details.
  4. Sieve analysis per CSA A23.2A or equal ASTM C136 for grading of bedding and joint sand.
  5. Manufacturer's product data, installation instructions, and material safety data sheets for the safe handling of the specified materials and products.

### 6. References

1. Canadian Standards Association (CSA) (latest Edition):
  1. CSA A231.2 - Precast Concrete Pavers
  2. CSA A23.2A - Sieve Analysis of Fine and Coarse Aggregates
  3. CSA A23.1 FA1 - Concrete Materials and Methods of Concrete Construction
  4. CSA A179 - Mortar and Grout for Unit Masonry

2. American Society of Testing and Materials (ASTM) (latest edition):
  1. C 29 Bulk Density and Voids in Aggregate Materials
  2. C 33 Specification for Concrete Aggregates
  3. C 67 Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile, Section 8, Freezing and Thawing
  4. C 136 Standard Test Method for Sieve Analysis for Fine and Coarse Aggregate
  5. C 140 Standard Test Methods for Sampling and Testing Concrete Masonry Units
  6. C 144 Standard Specifications for Aggregate for Masonry Mortar
  7. C 936 Standard Specifications for Solid Interlocking Concrete Paving Units
  8. C 979 Standard Specification for Pigments for Integrally Colored Concrete
  9. D 698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m<sup>3</sup> (12,000 ft-lb/ft<sup>3</sup>))
  10. D 1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (2,700 kN-m/m<sup>3</sup> (56,000 ft-lb/ft<sup>3</sup>))

3. Interlocking Concrete Pavement Institute (ICPI) (Latest Edition):

1. Tech Spec Technical Bulletins.

#### 7. Quality Assurance

1. Work of this Section shall be performed by skilled workforce trained in the installation of precast concrete unit paver systems, with minimum 2 years of experience. Submit acceptance of installer by unit supplier to Consultant prior to beginning any onsite work described by this Section.
2. Do work in accordance with written recommendation instructions of unit manufacturer for specific conditions in the work of this Contract.
3. Layout all work of this section in its entirety, together with grading work. Obtain review and acceptance of drainage patterns, lines, falls, curb drop locations and related items in the Site Grading and Drainage System, prior to beginning installation of any work described by this Section.
4. Products must be tested with manufacturer control procedures and sampling acceptable to the Consultant for achievement of tolerances, flexural strength requirements and uniformity of appearance. Submit reports to Consultant.

#### 8. Basic Product Requirements

1. Equivalent manufacturers of units may apply during the bidding period to be recognized as acceptable equivalents. All manufacturers of units must be members in good standing of concrete paver and precast pavement organizations with a minimum 5 year history of manufacture and supply of precast concrete pavement units acceptable to the Consultant.

#### 9. Basic Execution Requirements

1. Delivery, Storage, and Handling
  1. Remove, store and protect existing unit pavers in such a manner that no damage occurs.
  2. Joint sand shall be delivered and stored in original packaging and covered with a secure, opaque, waterproof covering to prevent exposure to rainfall, UV rays, or removal by wind. Insure the covering is secured in place.
  3. Store materials free from mud, dirt, and other foreign materials.
  4. Store cleaners and sealers in accordance with manufacturer's written instructions.

2. Environmental Conditions

1. Do not install sand or pavers during heavy rain or snowfall.
2. Do not install sand and pavers over frozen base or sub-base materials.
3. Do not install frozen or saturated base material or sand.
4. Do not install pavers on frozen or saturated sand.
5. Do not install jointing sand on wet or damp unit pavers.
6. Install jointing sands only during dry weather conditions, without rain in the forecast.

10. Warranties

1. Warrant in accordance with Division 1 requirements and;
  1. At no cost to Owner remedy any defects in work of this Section due to defects in materials and or workmanship provided under this Section, for a period of 2 (two) years from the date of Substantial Performance. Heaving, separation of joints, joint sand washout, cracking of units, and any other conditions detrimental to appearance or performance will be considered a defect.

11. Maintenance Manuals and Materials

1. Supply 5% of unit pavers for Owner's maintenance purposes. Replacement pavers shall be from the same production run as installed materials.
2. Supply additional bags of jointing sands sufficient to cover 10sq.m. (100sq.ft.).

12. Building Systems Requirements

1. The work described by this Section is related to the following Building Systems. Comply with requirements for performance, review and co-ordination of such systems:
  1. Barrier-Free Path of Travel System
  2. Emergency Egress System
  3. Site Grading, Drainage, and Water Infiltration System
  4. Exterior Finishes System

## 2. PRODUCTS

1. Concrete Unit Pavers

1. Standard of acceptance for manufacture of unit pavers is Permacon Boulevard 300 Module B system in various sizes to create a random pattern of: 6" by 12" (150mm by 300mm) 12" by 12" (300mm by 300mm) 6" by 18" (150mm by 450mm), all by 4" (100mm) thick. Colour shall be to Consultant selection from standard colour range. A separate colour shall be selected for perimeter border units, and for the field. Texture shall be Granitech.
2. Pavers shall meet the following physical requirements as set forth in CSA-A231.2, Precast Concrete Pavers:
  1. Average compressive strength of cubes cut from five pavers to be greater than 50MPa with no individual cube below 45MPa when tested in accordance with CSA A231.2.
  2. Average loss of three full size pavers less than 225g/m<sup>2</sup> after 28 freeze-thaw cycles or 500g/m<sup>2</sup> after 49 freeze-thaw cycles immersed in a 3% saline solution when tested in accordance with CSA A231.2.

2. Joint and Bedding Sands

1. Joint and bedding sands shall be provided new wheresoever concrete unit pavers are removed, and/or bedding sands become exposed to the elements.
2. Bedding Sands: 25mm (1") thick, washed, clean, non-plastic, free from deleterious or foreign matter, symmetrically shaped, natural or manufactured from crushed rock.
3. Joint Sands: HP<sup>2</sup> high performance polymeric jointing sand by Techniseal®, Permacon or equivalent conforming to the grading requirements of CSA A179.
3. Granular Base: Type 2 fill, to section 312300, minimum 150 mm (6") thickness.
4. Geotextile Fabric: Terrafix 270 or similar geo-textile cloth.
5. Edge Restraints: Edge restraints shall be used along all unrestrained paver edges and supported on a minimum of 150 mm (6") of aggregate base. Retaining walls (either existing or new), curbs, steps, stairs, maintenance pads, and concrete walkways are considered to be acceptable edge restraints.

3. EXECUTION

1. Site Preparation

1. Existing exterior surface finishes and appurtenances shall be removed, including but not necessarily limited to concrete walkways and surfaces, pre-cast unit pavers, pre-cast unit retaining wall systems, rubberized playground surfaces, embedded foundations and support of former play equipment, and asphaltic concrete. Provide all removals to the complete exterior space within the enclosed courtyard area.
2. Strip the site of all topsoil and other objectionable materials to the sub-grades as required for new unit paver surface finishing system, and all grades to existing STM drainage structures.
3. All new underground services and connections of such services to existing sub-drainage system must be completed in conjunction with subgrade preparation and prior to commencement of base construction.
4. The subgrade shall be trimmed to within 0 to ½ in. (0 to 10 mm) of the specified grades. The surface of the prepared subgrade shall not deviate by more than 3/8" (10 mm) from the bottom edge of a 39" (1.0m) straight edge laid in any direction.
5. Protect prepared subgrade from damage from inundation by surface water. No traffic shall be allowed to cross the prepared subgrade. Repair of any resulting damage at no cost to Owner.
6. Under no circumstances shall the Work of this Section proceed until the sub-grade has been certified by the SiteWorks Trade Contractor, and review and accepted by the Owner and Consultant.

2. Examination & Acceptance of Site Conditions

1. General Contractor shall inspect, accept and certify in writing that site conditions meet specifications prior to installation of interlocking concrete pavers, including but not limited to:
  1. Sub-grade preparation, to compacted densities and elevations conform to the specified.
  2. Installation of geotextiles in accordance with drawings, specifications.
  3. Aggregate bases and concrete slabs-on-grade are to specified material, thickness, compacted density, surface tolerances and elevations conform to specified requirements.

## Unit Pavers

4. Submit written density test results for soil sub-grade, and aggregate base materials to the Owner, Contractor and paver installation subcontractor.
  5. Verify location, type, and elevations of edge restraints, concrete collars around utility structures, and drainage inlets.
3. Geotextile Fabric
1. Ensure filter fabric to complete area concrete unit paver finish. Where missing or damaged, replace. Please note that costs for such replacements shall be addressed as a Change to the Contract.
  2. The intent of the filter fabric is:
    1. Where Unit pavers are installed over subgrade materials, to prevent fines of the compacted subgrade from migrating into the aggregate base course;
    2. Where unit pavers are installed over terrace waterproofing systems, to prevent fines of bedding sand materials from migrating into the drainage layer of protection boards.
  3. Lay filter fabric in longest runs possible.
  4. Lap joints in filter fabric material min. 200mm (8").
  5. Carry filter fabric up vertical face of all perimeter edges minimum to the mid point of unit paver thickness, and max 13 mm (1/2") from finished surface of pavers.
4. Granular Base
1. The base shall be placed in uniform lifts not exceeding 150 mm (6") loose thickness and compacted to at least 98% Standard Proctor Maximum Dry Density as per ASTM C 698-00ae1.
  2. Shape and roll alternately to obtain a smooth, even and uniformly compacted granular base and ensure conformity of grades with finish surface.
  3. Apply water as necessary during construction to obtain specified density. If granular base is excessively moist, aerate by scarifying with suitable equipment until moisture content is corrected.
  4. Ensure top of granular base does not exceed plus or minus 10mm over a 3m straightedge.
5. Edge Restraints
1. Adequate edge restraint shall be provided along the perimeter of all paving as specified. The face of the concrete edge restraint, where it abuts pavers, shall be vertical down to the base.
  2. All concrete edge restraints shall be constructed to dimensions and level specified and shall be fully and completely supported on the compacted granular base.
6. Bedding Sand
1. Place and spread the bedding sand evenly over the base course and screed to a nominal 25 mm (1") thickness.
  2. Do not disturb bedding sand once screeded.
  3. Screeded area shall not substantially exceed that which is covered by pavers in one day.
  4. Do not use bedding sand to fill depressions in the base surface.
  5. Do not use joint sand for bedding sand.

7. Installation of Unit Pavers

1. Ensure bedding sand and granular base are not saturated prior to placement of unit pavers.
2. Install unit paving true to grade on the bedding sand, in layout and pattern indicated. Where required, cut units accurately without damaging edges. Use only full bricks in the field. Install pavers with 10mm wide joints.
3. Compact and level pavers with min. 22 kN force mechanical plate vibrator. Use minimum 19 mm (3/4") thick plywood or neoprene pad under plate compactor and over brick until pavers are true to grade and free of movement.
4. Do not compact unit paving within 1.0 m (3'-3") of unrestrained edges.
5. Fill spaces between pavers by sweeping in sand.
6. Pass mechanical plate vibrator over unit paving to achieve compaction of sand in joints. Ensure joints are full at completion of compaction.
7. At completion of each work day, ensure all work within 1 m of lying face is left fully compacted with sand filled joints.
8. Surface of finished pavers: free from depressions exceeding 3mm (1/8") as measured using a 3.0m (10'-0") straight edge.
9. Sweep surface clean and check final elevations for conformance to grading and drainage plan.

8. Joint Sand

1. Perform jointing operations only when environmental conditions permit.
2. Ensure that surfaces are completely dry prior to installation of jointing sands. Any moisture present on the surface may cause the binder in the jointing sand to prematurely activate and adhere to unit pavers and adjacent hard surfaces. Failure to ensure dryness to manufacturer's recommendations may require removal and replacement of defective work. Determination of defect shall be made by the Consultant.
3. Spread jointing sand evenly over paver surfaces. Using a push broom, sweep sand to completely fill joints. Pass a plate vibrator over pavers to firm up joints. Repeat sweeping and plate vibrating as required until joints are completely packed, to a minimum of 3 mm (1/8") below paver finished surface.
4. Sweep the surface of the jointed pavers with a fine bristle brush.
5. Remove all residue using appropriate methods given site conditions. Surfaces of pavers must be free of all jointing sand material prior to wetting.
6. Wet surfaces, in accordance with jointing sand manufacturer's written instructions.

9. Field Quality Control

1. Elevation of completed paver installation shall not deviate more than 10mm (3/8") under a 3.0m (10'-0") long straightedge. Check final surface elevations for conformance to drawings. The surface elevation of pavers shall be 3 to 6 mm (1/8" to 1/4") above adjacent drainage inlets, concrete collars or channels. Pavers shall be installed with flush finished surfaces free from lips greater than 3 mm (1/8").

**END OF SECTION**

## 1. GENERAL

### 1. General Requirements

1. Comply with Division 1, General Requirements, and the Conditions of the Contract, which form part of this Section as if repeated herein.

### 2. Related Requirements

- |                                       |                    |
|---------------------------------------|--------------------|
| 1. Work Related to Existing           | Section 011030     |
| 2. Emergency Egress System            | Section 019521     |
| 3. Barrier-Free Path of Travel System | Section 019530     |
| 4. Historic Masonry                   | Division 04        |
| 5. Exterior Concrete                  | Existing to remain |
| 6. Existing Landscaped Areas          | Existing to remain |
| 7. Interior Building Signs            | Section 101400     |

### 3. Submittals

1. Submit in accordance with Division 1 requirements
  1. Shop drawings of each exterior sign type, and indicating dimension of sign, showing all verbiage and graphics, and font type and size.

### 4. Warranty

1. In accordance with Division 1 requirements.

### 5. Building Systems Requirements

1. The work described by this Section is a component of the Emergency Egress System and the Barrier-free Path-of-travel System. Comply with requirements for the integration of the work described in this Section into its roles in the various systems. Provide the work so that the performance requirements of the overall system of which it forms part is achieved.

## 2. PRODUCTS

### 1. Exterior Signs

1. Provide Signs to meet municipal traffic standards and Accessibility Standards. Signs shall use internationally accepted symbols. Refer also to the Site Plan for number and locations of signs:
  1. TS-01, Barrier Free Ramp Signs: 3 (three) signs required to the locations indicated on the Site Plan. Sign shall read "Access to Entrance" and shall be c/w internal symbol for access, and directional arrows: white on blue background, white border, rounded corners. Mount to vertical support posts within existing landscaped areas.
  2. TS-02, Warning Signs: 6 (six) signs required to read "This property is under video surveillance" and c/w CCTV camera symbol, black and white background. Mounted to building face.

### 2. Vertical supports

1. Steel posts for exterior signs shall be to CAN/CSA-G40.21, 4.0m long, flanged "U" shaped in cross section, measuring 65mm wide by 30mm deep. Metal thickness: 4.5mm. Hot dipped galvanized: to CAN/CSA-G164.

### 3. Fasteners

1. Galvanized hex bolts, nuts, and washers to suit holing to posts.

### **3. EXECUTION**

#### **1. General**

1. Contractor shall provide all exterior signs as part of this Contract. Location of all signs is shown on Drawings. Confirm final locations with Owner and Consultant on site prior to installation.
2. Generally, install signage just prior to handover, to avoid damage by construction activities.

#### **2. Installation**

##### **1. Sign support**

1. Erect supports to locations indicated, plumb and square. Coat buried portion of support with bituminous paint and allow to cure 24 hours before installation.
2. Single channel steel posts
  1. Drive to required depth without damage to posts.
  2. If rock or concrete is encountered, drill hole to required depth and set post in sand.
3. Impact posts – N/A tis Project
  1. Install in accordance with manufacturer's written recommendations.
  2. Ensure sufficient cover between faces of curb to fastener locations to prevent spalling.
  3. All fasteners to be galvanized.

##### **3. Signs**

1. Fasten signs to supporting posts and brackets, and to locations accepted by Consultant.
2. Install signs facing direction of pedestrian traffic flow, perpendicular to walkways and/or barrier-free paths of travel.

##### **4. Clean Up**

1. Clean signs and area of installation, and repair damage without expense to Owner.

**END OF SECTION**

# Region of Waterloo - 84 Frederick St. Renovation & Renewal

84 Frederick Street  
Kitchener, ON N2H 2L7



## Location of Work:

84 Frederick Street, Kitchener, Ontario



True North

## Key Plan n.t.s.



Project North

## Project Consultants:

### Architectural & Prime Consultant:

John MacDonald Architect Inc.  
195 King Street West, Suite 202  
Kitchener, ON N2G 1B1  
519-579-1700  
Contact: Matthew Muller  
e-mail: matthew@johnmacdonaldarchitect.ca

### Mechanical:

M.A. Bryan Engineering Inc.  
285 Weber Street N., Unit B1  
Waterloo, Ontario N2J 3H8  
519-489-2674  
Contact: Mark Bryan  
email: mark@maebryan.com

### Electrical Engineering:

Mighton Engineering Ltd.  
300 Victoria Street North  
Kitchener, Ontario N2H CR9  
519-745-3703  
Contact: Mike Jepsen  
email: mjepsen@mighton.com

### Building Science Engineering:

RJC Engineers  
40 Weber Street E., Suite 800  
Kitchener, ON N2H 6R3  
519-590-1546  
Contact: Jordan Swail  
e-mail: jswail@rjc.ca

## Professional Design

The design prepared by John MacDonald Architect inc. (the Consultant) is intended to govern changes or alterations as indicated in Documents, solely for the specific project noted, for use by the Owner under the terms and conditions of an agreement between the Region of Waterloo and John MacDonald Architect inc. The Documents do not imply a contractual relationship on the part of John MacDonald Architect inc. to any other party for any purpose, including but not limited to their use in the performance of the Work under agreements between other parties, or the use of the Work by other parties.

The design is based upon assumptions regarding existing conditions, which are implied in the design. The Owner shall verify existing conditions as the work proceeds, and identify immediately to the Consultant any condition revealed in the course of the Work which may not conform to initial assumptions expressed or implied by the Documents or the design.

## General Requirements:

This Work includes all measures required for protection of the public, users and the Work, including all temporary barriers, and protection required for installation of any materials and products to highest standards of quality for workmanship.

## List of Abbreviations:

See also Division 01

Common abbreviations are used in the preparation of these documents, and shall have meaning in accordance with such common usages. Additionally, use of the following abbreviations may occur:

BF	Barrier Free
C/W	Complete With
DIM	Dimension
Elec	Electrical
EP	Electrical Panel
Ex.	Existing
Exst.	Existing
FA	Fire Alarm
F.E.	Fire Extinguisher
F.R.R.	Fire Resistance Rating
F.S.	Fire Separation
GL	Glass
G.L.	Gridline
GWB	Gypsum Wallboard
IS	inside
LAP	Lay-in Acoustic Panel
LF	Light Fixture
Mech	Mechanical
MG	Make Good
N/A	Not Applicable
O/S	Outside
PLY	Plywood
PT	Paint
TBD	To Be Determined
TG	Tempered Glass
UC	Undercut
UNO	Unless Noted Otherwise
j.c.	Job Check: Owner and Temporary Tenant to confirm measurements to consultant immediately upon completion of selective demolition prior to proceeding with new Work. In case of discrepancy confirm instructions prior to proceeding.
HOLD	Critical dimension: Contractor to maintain exact dimension.
N.I.C.	Not in Contract: The only means by which something shown or specified shall be indicated as not being in the contract is by the use of the initials "NIC" or the words "not in (the) contract", or "by Owner".

## Authorities having Jurisdiction

Work undertaken is for interior renovations and maintenance renewals to an existing Group C Shelter Building. The Ground Floor of the building includes existing Dining and Commercial Kitchen facilities to support the shelter use, and are existing to remain. Upon completion of the renovations, the Shelter shall operate 24 hours a day, 7 days a week.

Work undertaken as part of an earlier phase of construction - of a Group C Women's only shelter - occupies the fully separated North wing of the Ground Floor of the Building only. This area is not included as part of the Work of this Contract and permit, unless specifically noted otherwise. The North Wing is fully occupied, and will remain occupied and under the care and control of the Owner for the duration of the construction activities. This temporary shelter presently operates as overnight shelter from 7:00PM to 8:30AM, but will operate as a full time, 24 hours a day seven days a week, shelter from March 31, 2024.

See also Sheet A011 for OBC information & Matrix.

It is the Consultant's understanding based upon information from the Owner, Region of Waterloo, and Planning Authorities (Garett Stevenson) that, given that no site changes are proposed in the Change of Use, that site plan approval is NOT required for this project.

There are no parking requirements for this site.

All work is to be performed to exceed the standards and regulations of Codes and authorities having jurisdiction.

All work to existing fire separations shall be undertaken to ensure continuity of such assemblies, and to maintain the existing fire resistance ratings. Fire-stop all penetrations whether existing or new.

Legend:	
	Building Elevation See A300 series Sheets
	Building Section See A400 series Sheets
	Wall Section See A600 series Sheets
	Foundation Wall Type, Wall Type See A000 series Sheets
	Floor Types, see A000 series Sheets Roof Types, see Sheet A215
	Partition Type See A000 series Sheets
	Ceiling Type See Sheet A501
	Room Numbers See Room Finish Schedule(s)
	Opening Numbers See Opening Schedule(s)
	Window Type, see A300 Sheets for Window Schedule(s)
	Millwork Type See A710 series Sheets
	Owner Equipment Numbers See Equipment Schedule(s)
	Denotes Existing Assembly
	Denotes Fire Separation
F.S.	Denotes Fire Separation
F.R.R.	Denotes Fire Resistance Rating
j.c.	job check indicates dimension which must be confirmed onsite

## List of Drawings:

The following list of documents are titled "RoW - 84 Frederick St. Renovation & Renewal" and noted as issued for purpose "T", For Tender, and dated December 19, 2024.

### Architectural Drawings:

The Documents include forty (40) 24" x 36" Architectural (A) drawings as follows:

A001	General Notes and Cover
A011	OBC Matrix & Information
A012	WC Accessories OBC Requirements
A021	Assembly Types
A031	Construction Sequencing Plan
A121	Site Plan
A201	Basement Removals Plan
A202	Ground Floor Removals Plan
A203	Second Floor Removals Plan
A204	Third Floor Removals Plan
A205	Roof Removals Plan
A211	Basement Plan
A212	Ground Floor Plan
A213	Second Floor Plan
A214	Third Floor Plan
A215	Roof Plan
A231	Basement Floor Finishes Plan
A232	Ground Floor Finishes Plan
A233	Second Floor Finishes Plan
A234	Third Floor Finishes Plan
A301	Building Elevations
A302	Building Elevations
A303	Building Elevations
A321	Window Coverings Schedule
A501	Basement Reflected Ceiling Plan
A502	Main Floor Reflected Ceiling Plan
A503	Second Floor Reflected Ceiling Plan
A504	Third Floor Reflected Ceiling Plan
A701	Stair Plans, Sections and Details
A702	Stair Plans, Sections and Details
A711	Millwork Details
A901	Basement Openings Schedule
A902	Ground Floor Openings Schedule
A903	Second Floor Openings Schedule
A904	Third Floor Openings Schedule
A911	Basement Room Finishes Schedule
A912	Ground Floor Room Finishes Schedule
A913	Second Floor Room Finishes Schedule
A914	Third Floor Room Finishes Schedule
A921	Owner Equipment Schedule

Further to the above, the Architectural drawings include the following twenty three (26) 8.5"x11" Section Detail drawings, bound separately:

1/B215	Section Detail @ Mech. Room
2/B215	Section Detail @ Mech. Room at t.o. Wall
3/B215	Section Detail @ Mech. Room at b.o. Wall
4/B215	Section Detail @ Door Sill
5/B215	Section Detail @ Exterior Wall
6/B215	Section Detail @ Mech. Room at Parapet
7a/B215	Section Detail @ Parapet
7b/B215	Section Detail @ Scupper
8a/B215	Section Detail @ Lower Roof @ Base of Wall
8b/B215	Section Detail @ Lower Roof @ Scupper Outlet
9a/B215	Section Detail @ Lower Roof @ Parapet
9b/B215	Section Detail @ Lower Roof @ Scupper
10/B215	Section Detail @ Sloped Roof @ Roof Edge
11/B215	Section Detail @ Sloped Roof @ Roof Peak
12/B215	Section Detail @ Sloped Roof @ RTU Curb
13/B215	Section Detail @ Sloped Roof @ Eave
14/B215	Section Detail @ Sloped Roof @ New Parapet
15/B215	Section Detail @ North Wing Roof @ Low Parapet
16/B215	Section Detail @ North Wing Roof @ High Parapet
17/B215	Section Detail @ North Wing @ New Roof Drain
18/B215	Section Detail @ Community Room @ Parapet
19/B215	Section Detail @ Community Room @ Window
20/B215	Section Detail @ Community Room @ Roof Drain
21/B215	Section Detail @ Planter
22/B215	Section Detail @ Breezeway South Side
23/B215	Section Detail @ Breezeway North Side

### Mechanical Drawings:

Further to the above, the drawings include fourteen (14) 24" x 36" Mechanical (M) drawing as follows:

M001	Mechanical General Notes and Schedules
M101	Basement - Plumbing Plan
M102	Ground Floor - Plumbing Plan
M103	Second Floor Floor - Plumbing Plan
M104	Third Floor - Plumbing Plan
M201	Basement - Hydronic Heating System Plan
M202	Ground Floor - Hydronic Heating System Plan
M203	Second Floor Floor - Hydronic Heating System Plan
M204	Third Floor - Hydronic Heating System Plan
M301	Basement - HVAC Plan
M302	Ground Floor - HVAC Plan
M303	Second Floor Floor - HVAC Plan
M304	Third Floor - HVAC Plan
M305	Roof - HVAC Plan

### Electrical Drawings:

Further to the above, the drawings include twelve (12) 24" x 36" Electrical (E) drawing as follows:

E1	Lighting Basement - RCP
E2	Lighting Ground Floor - RCP
E3	Lighting Second Floor - RCP
E4	Lighting Third Floor - RCP
E5	Power & Communications Basement - Floor Plan
E6	Power & Communications Ground Floor - Floor Plan
E7	Power & Communications Second Floor - Floor Plan
E8	Power & Communications Third Floor - Floor Plan
E9	Fire Alarm & Life Safety Basement - RCP
E10	Fire Alarm & Life Safety Ground Floor - RCP
E11	Fire Alarm & Life Safety Second Floor - RCP
E12	Fire Alarm & Life Safety Third Floor - RCP

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No.	Issued for Purpose	Date	Initial
1	30% Check Set	Dec. 05 '24	MM
2	90% Check Set	Dec. 12 '24	MM
T	For Tender	Dec. 19 '24	MM

## General Notes:

For Cover and General Notes see Sheet A001  
For OBC Matrix and Information see Sheet A012  
For WC Accessories OBC Requirements see Sheet A012  
For Assembly Types see Sheet A021  
For Sequence of Construction see Sheet A031  
For Site Plan see Sheet A121  
For Floor Plan Removals see A200 series Sheets  
For Floor Plans see A210 series Sheets  
For Roof Plan see Sheet A215  
For Roof Assembly Types see Sheet A215  
For Floor Finishes Plans see A230 series Sheets  
For Building Elevations see A300 series Sheets  
For Window Schedules see Sheet A311  
For Window Coverings Schedule see Sheet A321  
For Reflected Ceiling Plans see A500 series Sheets  
For Ceiling Assembly Types see Sheet A501  
For Wall Sections see A600 series Sheets  
For Stair Plans, & Sections see A700 series Sheets  
For Millwork see A710 series Sheets  
For Openings Schedules see A900 series Sheets  
For Room Finishes Schedules see A910 series Sheets  
For Owner Equipment Schedule see Sheet A921

For Mechanical Drawings see M series Sheets  
For Electrical Drawings see E series Sheets

No.	Revision	Date	Initial

## Project

### RoW - 84 Frederick St. Renovation & Renewal

84 Frederick St.  
Kitchener, ON

	Approved	AD
	Checked	MM
Drawing Title	Drawn	AJ

## General Notes and Cover

Scale (for 24x36" printing)	Dwg. No.
NTS	A001

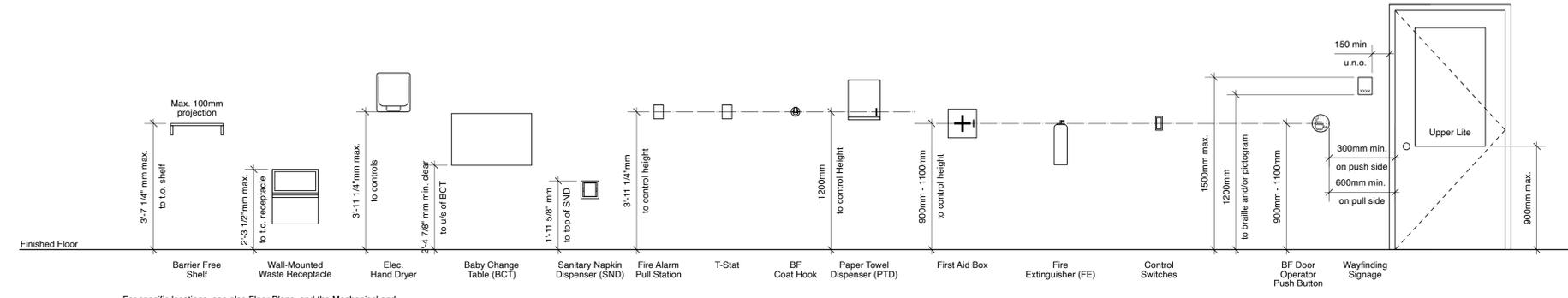
## John MacDonald Architect inc

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info@johnmacdonaldarchitect.ca (519) 579 1700



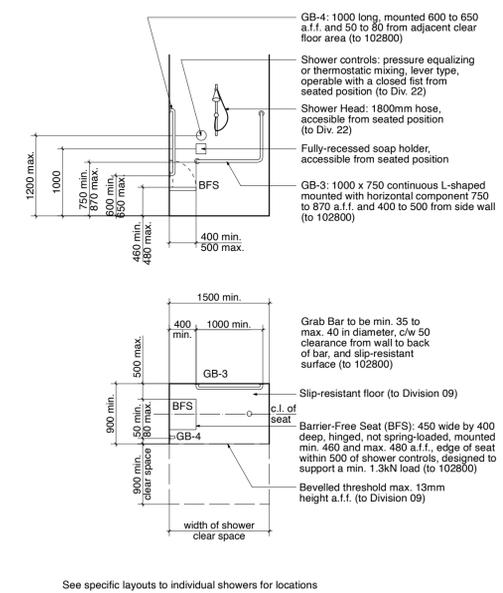
### Legend of Related WC Accessories Abbreviations:

- ACT - Adult Change Table
- BCT - Baby Change Table
- BF - Barrier-Free
- BFS - Barrier-Free Shower Seat
- CH - Coat Hook
- CLR - Clear
- F.F. - Finished Floor
- FL - Flush
- ODU - Garbage Disposal Unit
- GB - Grab Bar
- HSD - Hand Sanitizer Dispenser
- LAV - Lavatory
- Max. - Maximum
- Min. - Minimum
- MIR - Mirror
- PTD - Paper Towel Dispenser
- RSH - Recessed Soap Holder
- RO - Rough Opening
- SD - Soap Dispenser
- SDU - Sharps Disposal Units
- SH - Shower Head
- SSH - Surface-mounted Soap Holder
- SND - Sanitary Napkin Disposal
- TPD - Toilet Paper Dispenser
- T.O. - Top of
- WC - Water Closet

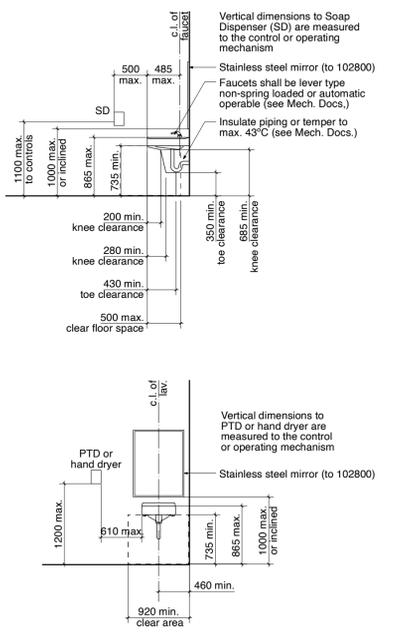


For specific locations, see also Floor Plans, and the Mechanical and Electrical Documents.  
Ensure minimum 810mm (32") by 1370mm (54") clear floor space at each device located in a barrier-free path-of-travel, centred on the device (see also Section 019530).

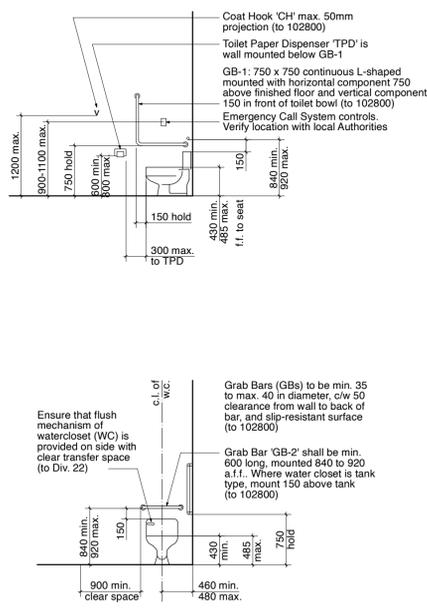
### 4 Accessory Mounting Heights A012 n.t.s.



### 3 WC Accessories @ BF Showers A012 n.t.s.



### 2 WC Accessories @ Lavatories A012 n.t.s.



### 1 WC Accessories @ WCs A012 n.t.s.

### General Notes:

- For Cover and General Notes see Sheet A001
- For OBC Matrix and Information see Sheet A011
- For WC Accessories OBC Requirements see Sheet A012
- For Assembly Types see Sheet A021
- For Sequence of Construction see Sheet A031
- For Site Plan see Sheet A121
- For Floor Plan Removals see A200 series Sheets
- For Floor Plans see A210 series Sheets
- For Roof Assembly Types see Sheet A215
- For Floor Finishes Plans see A230 series Sheets
- For Building Elevations see A300 series Sheets
- For Window Schedules see Sheet A311
- For Window Coverings Schedule see Sheet A321
- For Reflected Ceiling Plans see A500 series Sheets
- For Ceiling Assembly Types see Sheet A501
- For Wall Sections see A600 series Sheets
- For Stair Plans, & Sections see A700 series Sheets
- For Millwork see A710 series Sheets
- For Openings Schedules see A900 series Sheets
- For Room Finishes Schedules see A910 series Sheets
- For Owner Equipment Schedule see Sheet A921
- For Mechanical Drawings see M series Sheets
- For Electrical Drawings see E series Sheets

No.	Revision	Date	Initial

**Project**  
RoW - 84 Frederick St.  
Renovation & Renewal  
84 Frederick St.  
Kitchener, ON

Approved	AD
Checked	MM
Drawn	AJ

**WC Accessories OBC Requirements**

Scale (for 24x36" printing)	Dwg. No.
NTS	A012

**John MacDonald Architect inc**

### Foundation Wall (fw) Types:

#	Plan	Description
Ext. Int.		Existing Perimeter Foundation Walls to remain u.n.o.: - Ex. cast-in-place concrete foundations. Thickness varies. J.C. thickness; c/w - Ex. wallboard. - New paint finishes (to 099000).
Ext. Int.		Existing Perimeter Foundation Walls, Finished Interior to remain u.n.o.: - Ex. cast-in-place concrete foundations. Thickness varies. J.C. thickness; c/w - Ex. 3 5/8" steel studs at 16" o.c.w/ mineral wool insulation; - Ex. vapour barrier; and - Ex. 5/8" wallboard. - New paint finishes (to 099000).
Ext. Int.		Existing Perimeter Foundation Walls, Finished Interior to remain u.n.o.: - Ex. drainage board; on - Ex. 2" rigid insulation; on - Ex. cast-in-place concrete foundations. Thickness varies. J.C. thickness; c/w - Ex. air barrier; - Ex. 3 5/8" steel studs at 16" o.c.w/ mineral wool insulation; - Ex. vapour barrier; and - Ex. 5/8" wallboard. - New paint finishes (to 099000).
Ext. Int.		Existing Perimeter Foundation Walls to remain u.n.o.: - Ex. drainage board; on - Ex. 2" rigid insulation; on - Ex. cast-in-place concrete foundations. Thickness varies. J.C. thickness; c/w - Ex. air barrier; - Ex. 3 5/8" steel studs at 16" o.c.w/ mineral wool insulation; and - Ex. 5/8" wallboard. - New paint finishes (to 099000).
Ext. Int.		Existing Perimeter Foundation Walls to remain u.n.o.: - Ex. drainage board; on - Ex. 2" rigid insulation; on - Ex. cast-in-place concrete foundations. Thickness varies. J.C. thickness; c/w - Ex. air barrier; - Ex. 3 5/8" steel studs at 16" o.c.w/ mineral wool insulation; and - Ex. 5/8" wallboard. - New paint finishes (to 099000).
Ext. Int.		Existing Perimeter Foundation Walls to remain u.n.o.: - Ex. 12" concrete block. - New paint finishes (to 099000).

### Wall (w) Types:

#	Plan	Description
Ext. Int.		Existing Uninsulated Ext. Walls to remain u.n.o.: - Ex. 4" masonry brick (to Division 04); on - Ex. 8" nominal concrete block. - New paint finishes (to 099000). Provide brick repairs, pointing, and deep-pointing to Division 04. See also Building Elevations. See also Room Finishes Schedules.
Ext. Int.		Existing Walls to remain u.n.o.: - Ex. 4" brick; on - Ex. concrete block. Thickness varies; - Ex. air barrier; - Ex. 3 5/8" metal studs at 16" o.c.w/ mineral wool insulation; - Ex. vapour barrier; and - Ex. 5/8" wallboard. - New paint finishes (to 099000). Provide brick repairs, pointing, and deep-pointing to Division 04. See also Building Elevations. See also Room Finishes Schedules.
Ext. Int.		Existing Walls to remain u.n.o.: - Ex. wood cladding to be made good; on - Ex. 1" nominal vertical wood strapping, to form air gap and drainage channel; on - Ex. 4" brick masonry; on - Ex. concrete block, thickness varies; - Ex. air barrier; - Ex. 3 5/8" steel studs at 16" o.c. c/w mineral wool insulation; - Ex. sheet membrane vapour barrier; and - Ex. 5/8" wallboard, patch and make good; - New paint finishes (to 099000). See also Room Finishes Schedules.
Ext. Int.		Existing Walls to remain u.n.o.: - Ex. porcelain ceramic wall tile; on - Ex. 1/2" cement board; on - Ex. 1" steel furring channel @ 16" o.c. to form air gap and drainage channel; on - Ex. 4" masonry brick; on - Ex. concrete block, thickness varies; - Ex. 5/8" wallboard; and - New paint finishes (to 099000). See also Room Finishes Schedules.
Ext. Int.		Existing Walls to remain u.n.o.: - Ex. wood cladding; - Ex. 1" vertical wood strapping; - Ex. 1" exterior sheathing; - Ex. 6" steel studs at 16" o.c.w/ mineral wool insulation; - Ex. 6mil vapour barrier; and - Ex. 5/8" wallboard. - New paint finishes (to 099000). See also Room Finishes Schedules.
Ext. Int.		Existing Mechanical Walls to remain u.n.o.: - Ex. 7/8" corrugated horiz. steel cladding; on - Ex. 3/4" nominal wood straps; on - Ex. sheet air barrier; - Ex. 1" exterior sheathing; on - Ex. 6" nominal steel studs at ex. 16" o.c.; c/w mineral wool insulation to complete fill of cavity; - Ex. sheet vapour barrier; and - Ex. wallboard to form interior finish.

### Floor (f) Types:

#	Section	Description
Ex.		Existing Concrete Slab-on-Grade: - New floor finishes (to Division 09); on - Ex. 1 1/2" D.P. steel deck; with - Ex. 2 1/2" reinforced concrete slab; c/w - Ex. granular base; on - Ex. compacted natural fill. See Basement Floor Removals plan for extent of slab removals.
Ex.		Ex. Reinforced Concrete Deck on Steel Frame: - New floor finishes (to Division 09); on - Ex. wood sleepers; to remain; on - Ex. no. 2 steel reinforcing bar at 12" o.c. e-w; on - Ex. steel structural frame; - Ex. 2 (two) layers of 5/8" type X wallboard, to form min. 1.0 hour f.r.r. Firestop all penetrations (to 078400)
Ex.		Existing Concrete Deck on Wood Framing: - New floor finishes (to Division 09); on - Ex. wood slat flooring to remain u.n.o. to be made good as a substrate for new floor finishes; on - Ex. 2 1/2" reinforced concrete slab; in - Ex. 1 1/2" D.P. steel deck; - Ex. no. 2 steel reinforcing bar at 12" o.c. e-w; on - Ex. nominal 2x10 or 2x12 wood joists at ex. centres; with - Ex. 2 (two) layers of 5/8" type X wallboard, to form min. 1.0 hour f.r.r. Firestop all penetrations (to 078400)
Ex.		Existing Wood Deck on Wood Framing: - New floor finishes (to Division 09); on - Ex. plywood sheathing, to be made good as a substrate for new floor finishes (to 061000 and 096500); on - Ex. nominal 1" wood deck boards; on - Ex. nominal 2x10 or 2x12 wood joists at ex. centres; with - Ex. 2 (two) layers of 5/8" type X wallboard, to form min. 1.0 hour f.r.r. to structural frame. To all existing bathrooms/washrooms located on this floor assembly type, remove, remediate and replace all existing wood sub-flooring showing evidence of water damage or mould. For the purposes of Bidding, Bidders shall assume that all subfloor within bathrooms on 2nd and 3rd floor levels require removal, remediation and replacement.
Ex.		Existing Stair Landings and Floors: - New floor finishes (to Division 09); on - Ex. 2" concrete slab; on - Ex. 18 gauge steel pan; on - Ex. steel channel stringers; - Ex. support framing; - Ex. 1 (one) layer of 5/8" wallboard, to form ceiling finish; - New paint finishes (to 099000). Remove all damaged wallboard (to 024119), and replace with new 5/8" wallboard to match, taped, spackled, sanded, and finished (to 092000).
Ext. Int.		Existing Brezeeway Floor Assembly: - New waterproofing coating (see Site Plan); on - Ex. concrete paving to remain; on - Ex. 2 1/2" reinforced concrete slab; in - Ex. 1 1/2" D.P. steel deck; c/w - Ex. no. 2 steel reinforcing bar at 12" o.c. e-w; on - Ex. nominal 2x12 wood joists at ex. 16" o.c.; with - Ex. 2 (two) layers of 5/8" type X wallboard, to form min. 1.0 hour f.r.r. Firestop all penetrations (to 078400)
Ex.		New Concrete Slab-on-Grade: - 6" cast-in-place conc. slab-on-grade (033000); on - 6" granular A base, compacted (to 321300); on - Ex. compacted natural fill. Provide steel reinforcing bar to connect all new slabs to existing. See Details. See also Mechanical for New Floor Drains.

### Soffit (s) Types:

#	Section	Description
Roof Soffit		Prefinished Metal Soffit: - New prefinished steel soffit (to 076200) c/w trim; on - Ex. strapping or structure
Roof Soffit		Walkthrough Cementitious soffit: - Ex. cementitious finish; on - Ex. floor structure
Roof Soffit		Corner Window Soffit: - Ex. prefinished steel soffit; on - Ex. 3/8" plywood; on - Ex. structure

### Partition (p) Types:

#	Plan	Description
Ex.		Existing Concrete Partition to Remain u.n.o.: - Ex. cast-in-place concrete foundations. Thickness varies. J.C. thickness; - Ex. wallboard. - New paint finishes (to 099000) on both sides.
Ex.		Existing Concrete Block Partition to Remain u.n.o.: - Ex. normal weight concrete block to remain, nominal thickness indicated as X (6, 8, 10, 12). - New paint finishes (to 099000) on both sides.
Ex.		Existing Concrete Block Partition to Remain u.n.o.: - Same as px2 except wallboard layer on 1 (one) side of concrete block. - New paint finishes (to 099000) on both sides.
Ex.		Existing Concrete Block Partition to Remain u.n.o.: - Ex. concrete block. Thickness varies; - Ex. 3 5/8" steel studs at 16" o.c.w/ mineral wool insulation; and - Ex. 5/8" wallboard. - New paint finishes (to 099000).
Ex.		Existing Wood Framed Partition to Remain u.n.o.: - Ex. wallboard; on both sides of - Ex. nominal 2x4 or 2x6 wood studs. - New paint finishes (to 099000) on both sides.
Ex.		Existing Stud Partition to Remain u.n.o.: - Ex. wall board; - Ex. studs; - Ex. wall board; - Ex. 2 (two) layers of 5/8" type X wallboard. - New paint finishes (to 099000) on both sides.
Ex.		Existing Metal Studs Partition to Remain u.n.o.: - Ex. wallboard; on both sides of - Ex. 3 5/8" or 6" steel studs. - New paint finishes (to 099000) on both sides.
Ex.		New Metal Studs Partition: - 5/8" Wallboard (to 092000); on both sides of - Ex. 3 5/8" type X wallboard in lieu of abuse-resistant wallboard (to 092000); and with - Paint finishes (to 099000) on both sides.
Ex.		New Toilet Partition: - 25mm prefinished powder-coated steel toilet partitions c/w all hardware and support (to 102100).
Ex.		Acoustic Partition: - same as partition type p# above, except provide acoustic batt insulation to complete stud spaces, full depth of stud (to 092000). Seal perimeter of partition with acoustic sealant. Ensure devices accessed from opposite sides of the partition are offset into different stud cavity spaces.
Ex.		Load-bearing Partition: - same as p# above except constructed as part of the Building Structural System, to receive and transmit forces to foundations (to 054100 & 092000).
Ex.		Wet Area Partition: - same as p# above except provide 5/8" (16mm) tile backer board in lieu of gypsum wallboard (to 092000). w1 indicates tile backer board one side. w2 indicates tile backer both sides.
Ex.		Rated Partition: - For p# above provide 5/8" (16mm) type X wall board both sides in lieu of 5/8" (16mm) abuse resistant wallboard (to 092000). Construct Partition as a fire separation in order to achieve 1.0 hour fire resistance rating. See Floor Plans for extent of fire separation(s). Firestop all penetrations. Seal complete perimeter of all boards. Damper all ducts penetrating these assemblies, regardless of whether shown or not.

### Partition (p) Types Continued:

#	Plan	Description
Ex.		Abuse-Resistant Partition: - same as p# above except provide abuse-resistant wallboard in lieu of base specific wallboard.
Ex.		Existing Furring to Remain u.n.o.: - Ex. studs; - Ex. wallboard; on
Ex.		New Furring: - 5/8" wallboard (to 092000); on - 3 5/8" steel studs max. 16" o.c. (to 092000).
Ex.		New Insulated Furring: - New 5/8" impact resistant wallboard, taped, spackled, and sanded (to 092000); on - 10 mil sheet vapour retarder, all joints lapped and sealed with vr tape (to 072500) on - 3 5/8" steel studs max. 16" o.c. (to 092000); with - Mineral wool batt insulation to complete fill of cavity space (to 072000). - Vapour permeable air barrier membrane installed to face of existing block work; on - Existing block-work to remain. - Provide new paint finishes (to 099000). See also room Finishes Schedules. - Clean and abate surface of block-work prior to installation of furring.
Ex.		Acoustically Insulated Furring: - same as furring type fr# above, except provide acoustic batt insulation to complete stud spaces, full depth of stud (to 092000). Seal perimeter of partition with acoustic sealant.
Ex.		Moisture Resistant Furring: - same as fr# above except provide 5/8" (16mm) tile backer board in lieu of gypsum wallboard (to 092000).
Ex.		Fire Rated Furring: - same as fr# above except provide 2 (two) layers 5/8" (16mm) type X wallboard in lieu of abuse-resistant wallboard (to 092000); and with - fill cavity complete with stone-wool batt insulation (to 072000). All such furring must be accompanied by equivalent furred assembly on opposing side, installed to achieve 1.0 hour f.r.r. to ULC no. W449, or be constructed of shaft wall as described elsewhere on this Sheet.
Ex.		Abuse-Resistant Furring: - same as fr# above except provide abuse-resistant wallboard in lieu of base specific wallboard.

### Furring (fr) Types:

#	Plan	Description
Ex.		Existing Furring to Remain u.n.o.: - Ex. studs; - Ex. wallboard; on
Ex.		New Furring: - 5/8" wallboard (to 092000); on - 3 5/8" steel studs max. 16" o.c. (to 092000).
Ex.		New Insulated Furring: - New 5/8" impact resistant wallboard, taped, spackled, and sanded (to 092000); on - 10 mil sheet vapour retarder, all joints lapped and sealed with vr tape (to 072500) on - 3 5/8" steel studs max. 16" o.c. (to 092000); with - Mineral wool batt insulation to complete fill of cavity space (to 072000). - Vapour permeable air barrier membrane installed to face of existing block work; on - Existing block-work to remain. - Provide new paint finishes (to 099000). See also room Finishes Schedules. - Clean and abate surface of block-work prior to installation of furring.
Ex.		Acoustically Insulated Furring: - same as furring type fr# above, except provide acoustic batt insulation to complete stud spaces, full depth of stud (to 092000). Seal perimeter of partition with acoustic sealant.
Ex.		Moisture Resistant Furring: - same as fr# above except provide 5/8" (16mm) tile backer board in lieu of gypsum wallboard (to 092000).
Ex.		Fire Rated Furring: - same as fr# above except provide 2 (two) layers 5/8" (16mm) type X wallboard in lieu of abuse-resistant wallboard (to 092000); and with - fill cavity complete with stone-wool batt insulation (to 072000). All such furring must be accompanied by equivalent furred assembly on opposing side, installed to achieve 1.0 hour f.r.r. to ULC no. W449, or be constructed of shaft wall as described elsewhere on this Sheet.
Ex.		Abuse-Resistant Furring: - same as fr# above except provide abuse-resistant wallboard in lieu of base specific wallboard.

### General Notes to Walls, Partitions and Furring:

Unless otherwise noted, all partitions shall terminate at the underside of roof deck, floor slab or structure above (refer to floor plans, sections, and structural documents for additional information). Allow for movement of structure and provide lateral anchorage.

**Blocking (to 061000)**  
Provide blocking to mount all wall fastened items. Review complete documents and ensure blocking is reviewed by the Trade installing the finish item, prior to enclosing partitions and ceiling framing.

**Fire-Rated Assemblies (to 019522)**  
All assemblies requiring fire-resistance ratings and/or are constructed as fire separations shall be constructed in accordance with applicable ULC designs to achieve ratings or in accordance with O.B.C. SB-2 requirements for material thicknesses & component additive methods. Submit copies of ULC designs upon request of Consultant.

**Acoustic Insulated Assemblies (to 090500)**  
All assemblies requiring sound transmission class ratings and/or are constructed as acoustically insulated separations shall be constructed in accordance with applicable OBC designs to achieve STC ratings. Wherever acoustic assemblies are penetrated by Work of these Documents, provide complete seal of the penetration in order to maintain STC rating of assembly.

**Fire Stopping (to 078400)**  
Wherever fire-rated assemblies are penetrated by Work of these Documents, the Trade Contractor installing penetrating elements shall provide fire-stopping to complete fire-stopping of the penetration. Where assemblies meet us of deck, differing construction, and at movement joints, provide fire-stopping.

**Finishing (to 090500, 099000 and as applicable)**  
Unless otherwise noted, finish all walls, partitions, furrings, ceilings as per Finish Schedule.

### Partition (p) and Furring (fr) Symbol Modifiers:

	Indicates framing & wallboard to u/s ceiling only, includes lateral bracing to ceiling, c/w blocking.
	Indicates framing & wallboard to u/s of structure above.
	Indicates framing & wallboard to 150mm (6") above highest adjacent ceiling. Includes lateral bracing to u/s structure over.

### General Notes to Ceilings:

For Ceiling Assembly Types see Sheet A501.  
See Reflected Ceiling Plans and Room Finish Schedules for ceiling heights above datum.

### Note Regarding Wallboard:

**Wallboard**  
The term "wallboard" may refer to GWB, Type 'X' GWB, cement board, tilebacker board, gypsum sheathing (Dens GP or similar), impact-resistant GWB, water-resistant GWB, or other panel product as the case may require. Note that the Contract requires that wallboard be selected in accordance with the partition, wall, and ceiling requirements as well as the finishes that will be applied to the panel products and the end use of the adjacent areas and environments. Notwithstanding, impact resistant wallboard forms the basis for the Work and requirements for all partitions, unless specifically noted otherwise. See Section 092000 for more specific requirements.

### General Notes to Assemblies:

Make good all components of all assemblies as required where affected by the Work. Ensure continuity of thermal and weather barrier systems.  
See also Removals Plans.  
See also Room Finishes Schedules.  
Firestop all penetrations (to 078400) through fire rated partitions, furring, and all floor assemblies.  
See also Mechanical documents for existing and new floor drains, and plumbing fixtures.  
For Floor assemblies, see also Floor Finishes Plans.

No.	Issued for Purpose	Date	Initial
1	30% Check Set	Dec. 05 '24	MM
2	90% Check Set	Dec. 12 '24	MM
T	for Tender	Dec. 19 '24	MM

### General Notes:

For Cover and General Notes see Sheet A001  
For OBC Matrix and Information see Sheet A011  
For WC Accessories OBC Requirements see Sheet A012  
For Assembly Types see Sheet A021  
For Sequence of Construction see Sheet A031  
For Site Plan see Sheet A121  
For Floor Plan Removals see A200 series Sheets  
For Floor Plans see A210 series Sheets  
For Roof Plan see Sheet A215  
For Floor Plan Removals see A200 series Sheets  
For Floor Finishes Plans see A230 series Sheets  
For Building Elevations see A300 series Sheets  
For Window Schedules see Sheet A311  
For Window Coverings Schedule see Sheet A321  
For Reflected Ceiling Plans see A500 series Sheets  
For Ceiling Assembly Types see Sheet A501  
For Wall Sections see A600 series Sheets  
For Stair Plans, & Sections see A700 series Sheets  
For Millwork see A710 series Sheets  
For Openings Schedules see A900 series Sheets  
For Room Finishes Schedules see A910 series Sheets  
For Owner Equipment Schedule see Sheet A921  
For Mechanical Drawings see M Series Sheets  
For Electrical Drawings see E Series Sheets

## Project

RoW - 84 Frederick St.  
Renovation & Renewal  
84 Frederick St.  
Kitchener, ON

Approved	AD
Checked	MM
Drawn	AJ

### Assembly Types

Scale	Dwg. No.
(for 24x36" printing)	A021

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For Mechanical Drawings see M Series Sheets  
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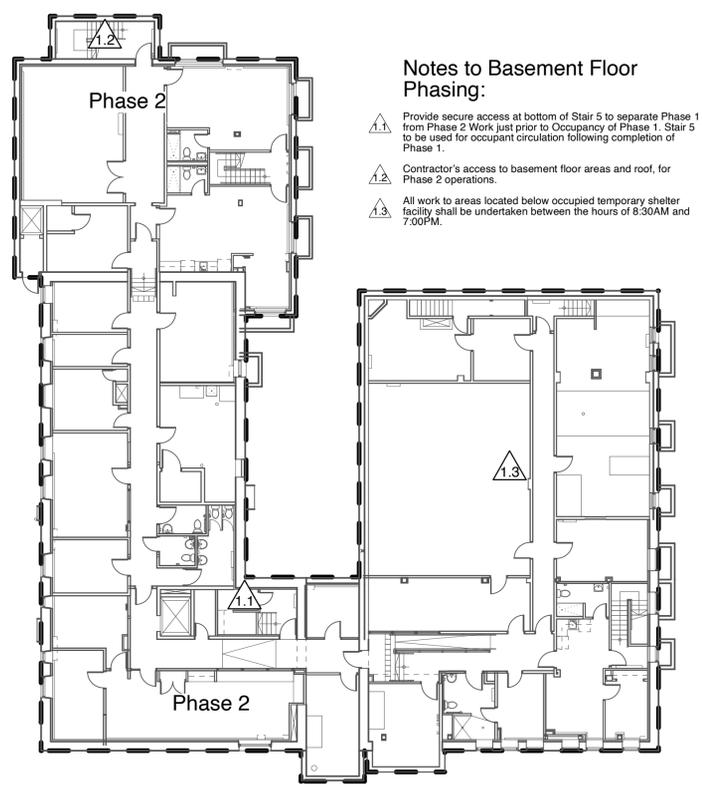
No.	Revision	Date	Initial

**Project**  
 RoW - 84 Frederick St.  
 Renovation & Renewal  
 84 Frederick St  
 Kitchener, ON

Approved	AD
Checked	MM
Drawing Title	Drawn AJ

**Construction Sequencing Plan**

Scale (for 24x36" printing) 1/16" = 1'-0"  
 Dwg. No. A031



**Notes to Basement Floor Phasing:**

- 1.1 Provide secure access at bottom of Stair 5 to separate Phase 1 from Phase 2 Work just prior to Occupancy of Phase 1. Stair 5 to be used for occupant circulation following completion of Phase 1.
- 1.2 Contractor's access to basement floor areas and roof, for Phase 2 operations.
- 1.3 All work to areas located below occupied temporary shelter facility shall be undertaken between the hours of 8:30AM and 7:00PM.

**1** Basement Floor Phasing Plan  
 A031 1/16" = 1'-0"



**Notes to second Floor Phasing:**

- 3.1 Construct temporary acoustic separation between occupied areas of Sleeping Room (room no. M07) and adjacent spaces of the Second Floor. Construct to minimize noise transmission from construction activities in to the occupied areas.
- 3.2 Contractor's access to basement floor areas and roof, for Phase 2 operations.

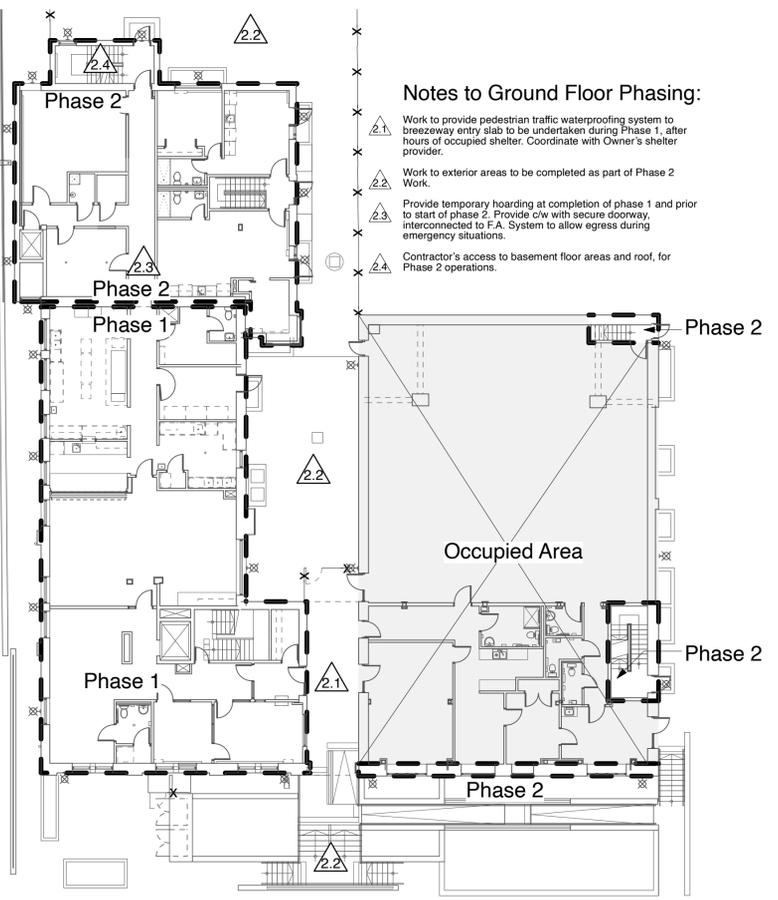
**3** Second Floor Phasing Plan  
 A031 1/16" = 1'-0"

**Notes to Construction Sequencing:**

Phase 1 shall be turned over to the Owner for Code occupancy, Ready for Use, at the Owner's sole judgement and criteria, prior to July 28, 2025.  
 Phase 2 shall be turned over to the Owner for Code occupancy, Ready for Use, at the Owner's sole judgement and criteria, prior to October 31, 2025.  
 Refer also to Section 013020 for project schedule milestones and interim milestones.  
 All Security Systems (Access Control and Video Surveillance) Work shall be completed as part of Phase 1 Work.  
 All Window Replacements to be complete as part of Phase 1 Work.

**General Notes to Construction Sequencing:**

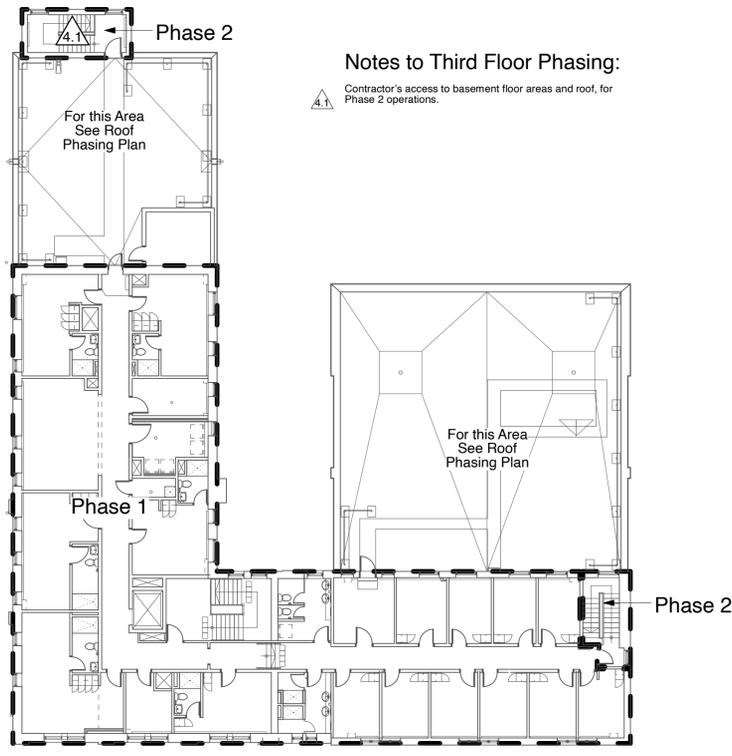
Ways and means for construction are solely the responsibility of the Contractor. The following is intended only as a summary of the assumptions upon which the design has been based. All sequencing requirements are not listed here. The Contractor shall prepare and submit for Owner's acceptance a construction plan showing all sequencing to meet the requirements of contract and achieving the objectives for the project, incorporating requirements of the Documents, including but not limited to Section 002000 and the Owner's Operations Safety and Security Conditions, and Division 1 requirements of the Specifications.  
 Install and maintain site facilities to a location agreed with the Owner. Remove all site facilities upon completion.  
 Maintain fire-fighter access and access to existing fire alarm system and fire alarm annunciator panel at all times to satisfaction of Owner and Fire Authorities throughout the construction of the Work.  
 Maintain all means of egress and exiting from all signed exits to the public right-of-way, in accordance with the Owner's Fire Plan. Obtain copy of such plan from Owner. Where means of egress or exits are affected by the Work, Contractor MUST obtain written acceptance from Fire Authorities and Owner, and provide all temporary measures as may be required or directed by such Authorities at no cost to the Owner.  
 Provide security fencing to Authority requirements and ensure completion of site boundary. Post Signs directing all construction deliveries.  
 Note that the full extent of Work is not shown in the sequencing diagrams and area Work Plan.  
 Perform ALL locates to accurately determine position of all underground services, including private services. Pay all costs for this Work. Note that existing electrical and communications feeds are critical to the Owner's operations, and special care shall be taken in protecting such feeds at all times during the Work. Pay all Costs for protection and make good any damage immediately.  
 Maintain existing patterns of drainage to the site, and make alternate temporary patterns as required to ensure that storm from adjacent areas does not disturb construction or enter excavations. Remove, alter, and otherwise maintain site drainage as required to accomplish drainage and siltation control throughout the Work.  
 Provide and maintain erosion and siltation control measures to ensure that no silt enters the Municipal Storm sewerage system. Remove, alter, clean and otherwise maintain all erosion and siltation control measures as directed by Owner, Consultant or Authorities, at no cost to the Owner. Clean by vacuum all silt and or sediment from the site STM sewerage system prior to handover of exterior Work to the Owner.



**Notes to Ground Floor Phasing:**

- 2.1 Work to provide pedestrian traffic waterproofing system to breezeway entry slab to be undertaken during Phase 1, after hours of occupied shelter. Coordinate with Owner's shelter provider.
- 2.2 Work to exterior areas to be completed as part of Phase 2 Work.
- 2.3 Provide temporary hoarding at completion of phase 1 and prior to start of phase 2. Provide c/w with secure doorway, interconnected to F.A. System to allow egress during emergency situations.
- 2.4 Contractor's access to basement floor areas and roof, for Phase 2 operations.

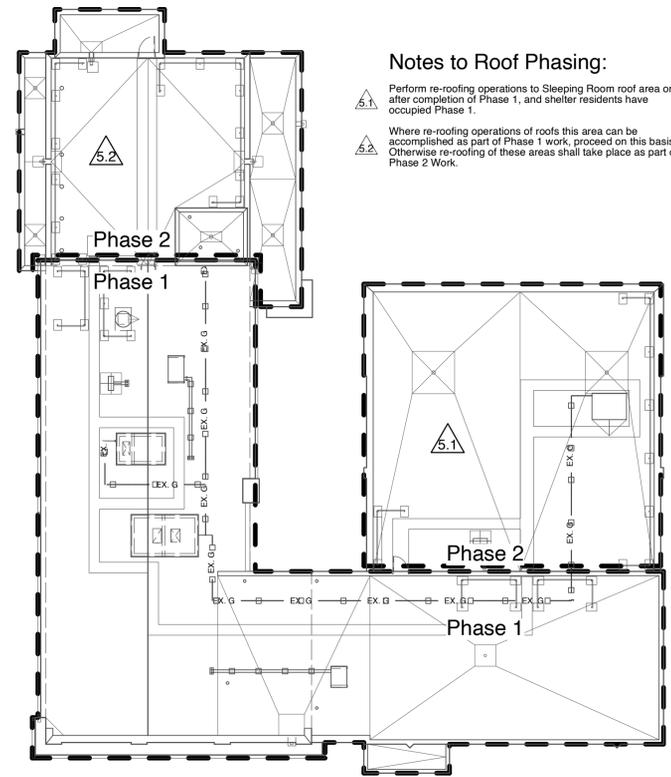
**2** Ground Floor Phasing Plan  
 A031 1/16" = 1'-0"



**Notes to Third Floor Phasing:**

- 4.1 Contractor's access to basement floor areas and roof, for Phase 2 operations.

**4** Third Floor Phasing Plan  
 A031 1/16" = 1'-0"



**Notes to Roof Phasing:**

- 5.1 Perform re-roofing operations to Sleeping Room roof area only after completion of Phase 1, and shelter residents have occupied Phase 1.
- 5.2 Where re-roofing operations of roofs this area can be accomplished as part of Phase 1 work, proceed on this basis. Otherwise re-roofing of these areas shall take place as part of Phase 2 Work.

**5** Roof Phasing Plan  
 A031 1/16" = 1'-0"

QUEEN STREET

ST. PETER'S LUTHERAN CHURCH

Site Finishes (sf) Types:

#	Section	Description
(sf1)		Unit Paver Pavement: - New 6" (150mm) precast concrete unit pavers (to 321400); sloped to catch basins, and away from building perimeter; on - New 1" (25mm) bedding sand (to 321400); on - New 6" (150mm) Type 2 granular base (to 3212300); on - Ex. compacted sub-base, grade to suit finished grades.

Notes to Fire Safety Plan:

A Revised Fire Safety Plan shall be prepared by the Building Owner and Operator, and submitted to the Fire Department. Operator shall review the Fire Safety Plan with Fire Department, and shall provide any supplementary emergency protocols requested by Authorities or contained within the Fire Safety Plan as accepted by Authorities, and shall ensure a copy is present on the premises in a suitably marked lock box.

This may include, but not be limited to, Fire Alarm drills conducted during the Temporary Shelter Occupancy hours where requested by the Fire Department.

Legal Property Description:

Part of Lots 4 & 5 R.P. 368 in the City of Kitchener, Regional Municipality of Waterloo.

Disclaimer:

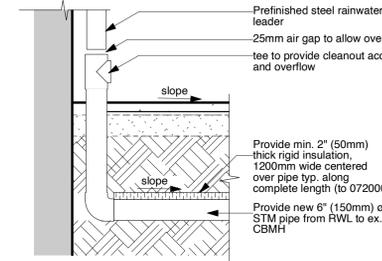
This drawing has been reproduced from information supplied by the Owner, using a Site Plan and Landscape Plan Drawing dated February 27, 2006, as prepared by The Walter Frey Partnership. John MacDonald Architect does not warrant the accuracy of any information on this drawing.

Legend & Site Abbreviations:

BLDG	denotes Building
BO	denotes Bottom Of
CB	denotes Catch Basin
CBMH	denotes Catch Basin Manhole
CCTV	denotes Security System Camera
EX	denotes Existing
EXIST	denotes Existing
FA	denotes Fire Alarm
FAAP	denotes Fire Alarm Annunciator Panel
FACP	denotes Fire Alarm Control Panel
FH	denotes Fire Hydrant
GM	denotes Gas Meter
HP	denotes Hydro Pole
LF	denotes Light Fixture
O/H	denotes Overhead
STM	denotes STM
TS	denotes Traffic Sign
TO	denotes Top Of
RWL	denotes Rain Water Leader
▲	denotes Building Entry
▽	denotes Building Exit

Notes to Existing Patterns of Grading & Drainage:

Prior to start of new exterior finishes, Contractor shall survey all structures and surfaces within the Exterior Courtyard, and fenced in area to confirm all existing grades. This work shall be performed by a registered Ontario Land Surveyor. Submit topographic survey to Consultant for information and record. Surveyor shall further confirm all finished grades for new surfaces and to ensure slopes to existing STM structures, and to maintain existing patterns of grading and drainage. Submit for Consultant review and acceptance.



2 Section Detail @ RWL Connection to STM Pipe 1/2" = 1'-0"

Notes to Site Plan:

- Provide horizontal extension to RWL FA, min. 4'-0" (1200mm) long, sloped away from building. Provide c/w precast concrete splash-pad to landscaped area.
- Provide cementitious epoxy repairs to existing spalled concrete. Provide anchorages in to concrete.
- Provide new colour contrast painted nosings, typ. to leading edges of all existing concrete stair treads. Colour shall be safety yellow. Remove existing paint finish by pressure-wash prior to painting.
- Provide prefabricated, surface-applied, domed tactile hazard warning surfaces, typical to top of all existing stair flights and all existing ramp sections. Tactile surfaces shall be minimum 12" (300mm) depth, and to complete width of existing stairs and ramps. Colour shall be black.
- Provide new quick-dry, non-slip, abrasion resistant, waterproof pedestrian coating traffic system to breezeway concrete walkway. Tremco FUMA or equivalent. Colour: standard 'Grey'. Apply prior to installation of tactile hazard warning systems.
- Provide waterproof sealant along base of existing breezeway exterior walls, to direct surface water away from walls. Sealant shall be fully compatible with pedestrian coating system. Install sealant such that it does not adversely affect existing rainscreen drainage space of walls.
- New RWL FA to grade. Provide sloped horizontal outlet to discharge into existing adjacent landscaped area. Provide precast concrete splash-pad at discharge locate. Ensure fully supported and secured to face of building.
- New RWL FA to grade. Provide horizontal outlet and precast concrete splash-pad. See also Floor Plans and Roof Plan.
- Existing gas meter and chain link fence enclosure to remain.
- Existing gas service, from meter location to face of building foundations and penetration in to building, to remain. Make good penetration to ensure fully sealed against ingress of water.
- Existing concrete steps to remain.
- New RWL FATB grade to connect to site STM system. See also Detail this Sheet.
- New 6" (150mm) o STM pipe laid to fall min. 1%, to connect to existing catch basin. Provide min. 2" (50mm) rigid insulation to along complete length of pipe to protect from frost.
- Existing Catchbasin 'CB1' to remain, for modification for new incoming STM pipe this contract. T/G = 342.28 job check. Adjust grate elevation as may be required to ensure surface flow away from building to catch basin. Existing West invert = 341.44 job check. New East invert = 341.54+/-.
- Existing Catch Basin Manhole 'CBMH1' to remain. Adjust grate and rings to suit new grades and surface finishes. Existing T/G = 342.46 job check. New T/G = 342.400 job check. Minimum slope to finished surfaces in Courtyard to be 1.25%. Maximum surface slope within Courtyard to be 2%. Ensure.
- Provide silt-sack to existing STM structures. See also Division 01.
- Mount Accessible building entry signs adjacent to main building entrances, these locations. See also 101400. Mount to Code.
- Remove all components of former recessed wall-mounted exterior luminaire to existing concrete retaining wall this location. Provide new galvanized steel cover plate secured to face of concrete.
- Coordinate all new Work this Contract with adjacent western property owner's contractor, who shall be installing a new opaque fence along the full length of the west property line. This work will occur during the Contract Time. Existing chainlink fence to remain, for removal by the adjacent contractor. All temporary measures required during the installation of adjacent fence are by that Contractor, n.i.c.
- Provide new galvanized steel grate to window well. Grates and securements of grates shall be designed to resist min. 4.8kPA live load.

1 Site Plan 3/32" = 1'-0"

General Notes to Site Access and Temporary Controls and Facilities

Refer to the Shortform Division 01 specifications.

There is no parking available on this site. Contractor and Trade Contractor's shall make their own parking arrangements.

For existing SAN facilities for Contractor's use, see Floor Plans.

Notes to Site Access:

- Existing 84 Frederick Street main level is divided into two wings (South & North) that share a common exterior breezeway and courtyard. Main entry to the existing Shelter facility including Principal Firefighting entry are located off of the breezeway/courtyard. Fire Alarm Annunciator Panel is located within the vestibule of the main entry to the existing Shelter. Fire Alarm Control Panel is located within adjacent room. Ensure that access to fire alarm annunciator and control panels is provided at all times in accordance with present Fire Department protocols and Fire Safety Plan. Fire Alarm is two stage.
- This existing Door shall be used for emergency egress only. Not an operational entrance for the Temporary Shelter Operation located on the Ground Floor of the North Wing. Maintain exiting at all times, free and clear of all construction materials and debris.
- This existing Door shall be used as a Principal operational entry for the Temporary Shelter Operation located on the Ground Floor of the North Wing. Maintain access at all times, free and clear of construction materials and debris.
- Contractor's access to the Place of the Work for deliveries.
- Owner's existing temporary secure fencing this area to remain. Obtain keys from Owner for access to the Place of the Work from Frederick Street.
- Existing exit stair for Contractor's use during construction.

Notes to Site Removals:

- Remove and replace existing exterior luminaire. See also Electrical Documents.
- Remove existing precast unit retaining wall and planter bed, complete with all soils & granular fills, and dispose.
- Remove existing cast iron tree grate and dispose.
- Remove existing mechanical units and security enclosure in order to remove existing courtyard hard surfaces. Reinstall mechanical units and security enclosure to match existing configuration and layout.
- Remove existing asphaltic concrete complete to courtyard and within fence enclosure, and dispose.
- Remove existing rubberized play surface, and dispose. Remove all foundations and posts for former play equipment this area and dispose.
- Remove existing unit pavers this area, and dispose.
- Carefully remove and store existing galvanized steel grates as required to facilitate window replacements and cleaning of window well. Reinstall grates to ensure window wells are secure. Reinforce as required to ensure all loading conditions are maintained. See also Building Elevations.
- Remove temporary plywood protections from existing windows as required to suit window replacement work. Protect new windows with plywood until handover of the completed Work to the Owner.
- Carefully remove and store existing galvanized steel grates. Clean all debris from window wells. Upon completion of cleaning, reinstall grates to ensure window wells are secure. Reinforce as required to ensure all loading conditions are maintained. See also Building Elevations.

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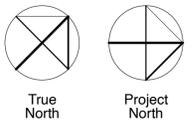
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Project RoW - 84 Frederick St. Renovation & Renewal

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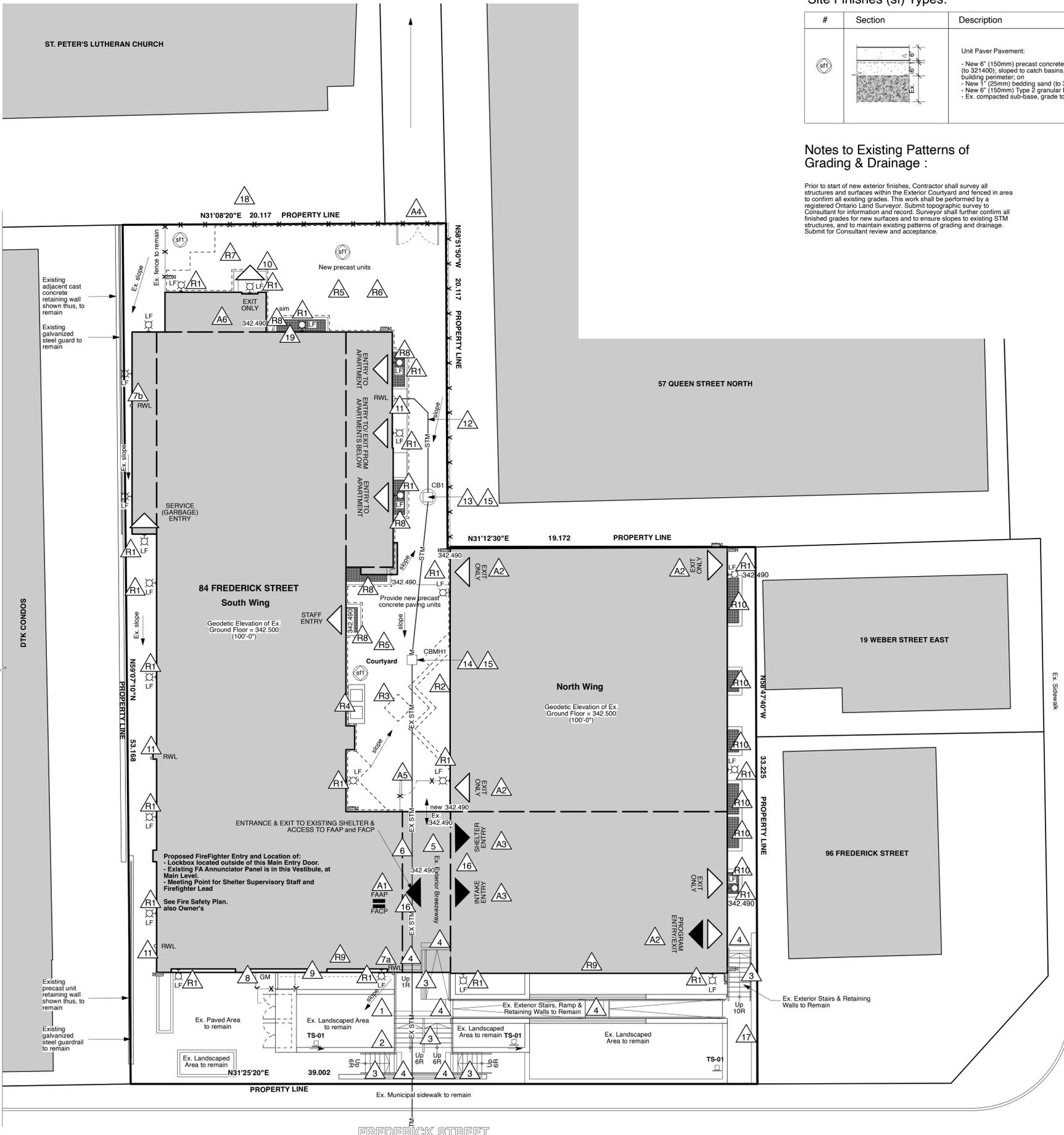
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Checked	MM
Drawn	MM

Site Plan

Scale	Dwg. No.
(for 24x36" printing) 3/32" = 1'-0"	A121

John MacDonald Architect inc

195 King Street West, Suite 202 Kitchener, ON N2G 1B1  
info@johndonaldarchitect.ca (519) 579 1700



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### Notes to Basement Floor Removals:

1. Remove door, frame, and hardware complete, and dispose. Enlarge the opening to suit new frame or relocate door to suit new layout. See Openings Schedule and Floor Plans.
2. Remove door, frame, and hardware complete, and dispose. Prep opening for new frame. See Openings Schedule.
3. Remove door and hardware, and dispose. Existing frame to remain, prep for new door. See Openings Schedule.
4. Remove hardware as per Opening Schedule. Prep existing frame and door for new hardware.
5. Remove door, frame and hardware completely, and dispose.
6. Remove plumbing fixture, and dispose. Prep for new fixture.
7. Remove vanity c/w sink and trim, and dispose. Make good surfaces.
8. Remove all washrooms accessories, and dispose.
9. Disconnect and remove light fixtures in accordance with Electrical Lighting Plan. Job check existing circuiting. All disconnects, modifications to wiring, reconstructions are included in the Contract Price. See also Electrical documents.
10. Remove and dispose floor finish c/w base and make good all wood subfloors and wall substrates to receive new finish. See Room Finishes Schedule.
11. Remove partitions, and dispose. Make good all subfloors and wall substrates to receive new finish. See Room Finishes Schedule.
12. Remove LAP ceiling grid, and dispose.
13. Remove millwork, and dispose. Make good surfaces.
14. Remove handrails, and dispose. Make good surfaces.
15. Remove toilet partitions, and dispose. Make good surfaces to receive new finish. See Room Finishes Schedule.
16. Remove portion of interior wall assembly as required to suit new Openings Schedule.
17. Remove portions of concrete slab, and dispose. Cap and abandon all plumbing piping. Prep for concrete slab infill.
18. Remove mirrors, and dispose. Make good surfaces to receive new finish.
19. Remove plumbing fixture, store for reinstallation after flooring installation.
20. Remove shower trim, and dispose. Prep for new trim.
21. Abate all mould, mildew, and water damaged wallboard ceiling, and dispose.
22. Remove furred partition, and dispose. Expose steel structure and remediate. See also Floor Plans.
23. Remove bath tub c/w trim, and dispose. Make good surface, and prep for new shower unit.
24. Remove water damaged wallboard from this wall, and dispose. See also Floor Plans.
25. Remove hydronic baseboard heater, and dispose. See also Mechanical Documents.
26. Remove, store and reinstall light fixtures upon completion of ceiling work.
27. Remove existing window infill, and dispose. Prep for new wall infill.
28. Remove sauna in its entirety, c/w electrical and mechanical. See also Mech & Elec documents.
29. Remove window unit c/w interior sill, and dispose. Prep opening for new window and sill.
30. Following completions of the renovations, and just prior to handover to the Owner for Occupancy, remove the temporary plywood protection from window, and dispose.
31. Disconnect, remove and dispose electric baseboard heater. See also Opening Schedule and Electrical Documents.
32. Remove and reinstall existing hardware as required to suit new hardware and access control system requirements. See also Opening Schedule and Electrical Documents.

### Legend:

- 1 A301 Building Elevation See A300 series Sheets
- 1 A401 Building Section See A400 series Sheets
- 1 A601 Wall Section See A600 series Sheets
- WF Foundation Wall Type, Wall Type See A600 series Sheets
- FP Floor Types, see A000 series Sheets Roof Types, see Sheet A215
- PT Partition Type See A000 series Sheets
- CP Ceiling Type See Sheet A501
- 07 Room Numbers See Room Finish Schedule(s)
- 10 Opening Numbers See Opening Schedule(s)
- Wxx Window Type, see A300 Series Sheets for Window Schedule(s)
- Mxx Millwork Type See A710 series Sheets
- 1.1 Owner Equipment Numbers See Equipment Schedule(s)
- Denotes Existing Assembly
- Denotes Fire Separation
- F.S. Denotes Fire Separation
- F.R.R. Denotes Fire Resistance Rating
- j.c. job check indicates dimension which must be confirmed onsite

### General Notes to Removals:

Not all removals are shown. Carefully examine existing conditions and the documents, including the site plans and the reference documents. Perform all removals and alterations required to perform the Work. Perform all demolition in accordance with construction sequencing requirements.

Provide all cutting and patching required for the structural, mechanical and electrical work for this contract. Coordinate requirements and costs with Trade Contractors. All costs for this work are included in the Contract Price.

Dashed lines indicate items for removal. Dispose as noted. Salvage as noted. Turn over to Owner as noted.

For Structural removals, see also Structural Documents. For Mechanical removals, see also Mechanical Documents. For Electrical removals, see also Electrical Documents.

Owner shall remove all loose furniture, appliances, and loose furnishings prior to handover of the facility to the Contractor. Owner shall remove all interior building signage prior to handover of the facility to the Contractor.

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For Mechanical Drawings see M series Sheets For Electrical Drawings see E series Sheets

### General Notes to Removals Plans:

Not all existing floor slab removals are shown. All such removals are included in the Contract. See also Mechanical Documents for extent of below slab plumbing requirements.

Not all existing ceiling system removals are shown. All such removals required to perform the Work are included in the Contract Price. See also Architectural Reflected Ceiling Plans & the Mechanical and Electrical Documents.

Note that new penetrations through existing roof structure, to accommodate new mechanical and electrical are not shown. All such penetrations required to perform the Work are included in the Contract Price. See also Mechanical and Electrical Documents.

### General Notes to Lockset Removals:

All existing locksets that are keyed to the Owner's Best system, and that are scheduled for removal, shall be turned over to the Owner. DO NOT DISPOSE.

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**Project**  
**RoW - 84 Frederick St.**  
**Renovation & Renewal**  
 84 Frederick St  
 Kitchener, ON

Approved	AD
Checked	MM
Drawing Title	Drawn AJ

**Basement Floor**  
**Removals Plan**

Scale (for 24x36" printing) Dwg. No.  
 1/8" = 1'-0" **A201**

**John MacDonald Architect inc**

195 King Street West, Suite 202 Kitchener, ON N2G 1B1  
 info@jhmarchitect.com (519) 579 1700



**1** Basement Floor Removal Plan  
 A201 1/8" = 1'-0"

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The reader shall immediately notify the Architect of all inconsistencies, errors, or omissions which they may discover in this or other documents, or in their relation in whole or in part.

### Notes to Ground Floor Removals:

1. Remove door, frame, and hardware complete, and dispose. Enlarge the opening to suit new frame or relocate door to suit new layout. See Openings Schedule and Floor Plans.
2. Remove door, frame, and hardware complete, and dispose. Prep opening for new frame. See Openings Schedule.
3. Remove door and hardware, and dispose. Existing frame to remain, prep for new door. See Openings Schedule.
4. Remove hardware as per Opening Schedule. Prep existing frame and door for new hardware.
5. Remove door, frame and hardware completely, and dispose.
6. Remove plumbing fixture, and dispose. Prep for new fixture.
7. Remove vanity c/w sink and trim, and dispose. Make good surfaces.
8. Remove all washrooms accessories, and dispose.
9. Disconnect and remove light fixtures in accordance with Electrical Lighting Plan. Job check existing circuiting. All disconnects, modifications to wiring, reconstructions are included in the Contract Price. See also Electrical documents.
10. Remove and dispose floor finish c/w base and make good all wood subfloors and wall substrates to receive new finish. See Room Finishes Schedule.
11. Remove partitions, and dispose. Make good all subfloors and wall substrates to receive new finish. See Room Finishes Schedule.
12. Remove LAP ceiling grid, and dispose.
13. Remove millwork, and dispose. Make good surfaces.
14. Remove portion of interior rated wall assembly as required to suit new opening. See also Floor Plan, and Openings Schedule. Provide all modifications to existing assembly as may be required, and make good fire separation to ensure continuity of exist. f.r.r.
15. Remove exhaust fan c/w all ductwork and vent hood, and dispose. Make good surfaces to receive new finish. See Room Finishes Schedule.
16. Remove screen, and dispose. Prep opening for new screen.
17. Remove plumbing fixture, and dispose. Make good surfaces to receive new finish. See Room Finishes Schedule.
18. Remove wallboard ceiling, and dispose. Make good f.r.r. above. Prep for new LAP ceiling.
19. Remove wallboard, and dispose. Prep for new surface.
20. Remove ceiling, this area for work to roof drains above, and dispose.
21. Abate and remediate all mould, mildew, and water damaged subfloor. Repair and replace as may be required. Area shown hatched.
22. Remove bath tub c/w trim, and dispose. Make good surface, and prep for new shower unit.
23. Sand, fill and repair existing wood floor to receive new finish. See Room Finishes Schedule.
24. Remove hydronic baseboard heater, and dispose. See also Mechanical Documents.
25. Remove existing window infill, and dispose. Prep for new wall infill.
26. Remove window unit c/w interior sill, and dispose. Prep opening for new window and sill.
27. Remove plywood protection, store, and reinstall after installation of new window. Following completions of the renovations, and just prior to handover to the Owner for Occupancy, remove the temporary plywood protection from window, and dispose.
28. Following completions of the renovations, and just prior to handover to the Owner for Occupancy, remove the temporary plywood protection from window, and dispose.
29. Disconnect, remove and dispose electric baseboard heater. See also Mechanical Documents.
30. Remove and reinstall existing hardware as required to suit new hardware and access control system requirements. See also Opening Schedule and Electrical Documents.
31. Remove handrails, and dispose. Make good surfaces.

### Legend:

- Building Elevation  
See A300 series Sheets
- Building Section  
See A400 series Sheets
- Wall Section  
See A600 series Sheets
- Foundation Wall Type, Wall Type  
See A000 series Sheets
- Floor Types, see A000 series Sheets  
Room Types, see Sheet A215
- Partition Type  
See A000 series Sheets
- Ceiling Type  
See Sheet A501
- Room Numbers  
See Room Finish Schedule(s)
- Opening Numbers  
See Opening Schedule(s)
- Window Type, see A300 Series Sheets  
for Window Schedule(s)
- Millwork Type  
See A710 series Sheets
- Owner Equipment Numbers  
See Equipment Schedule(s)
- Denotes Existing Assembly
- Denotes Fire Separation
- F.S. Denotes Fire Separation
- j.c. job check indicates dimension which must be confirmed onsite

### General Notes to Removals:

Not all removals are shown. Carefully examine existing conditions and the documents, including the site plans and the reference documents. Perform all removals and alterations required to perform the Work. Perform all demolition in accordance with construction sequencing requirements.

Provide all cutting and patching required for the structural, mechanical and electrical work for this contract. Coordinate requirements and costs with Trade Contractors. All costs for this area are included in the Contract Price.

Dashed lines indicate items for removal. Dispose as noted. Salvage as noted. Turn over to Owner as noted.

For Structural removals, see also Structural Documents.  
For Mechanical removals, see also Mechanical Documents.  
For Electrical removals, see also Electrical Documents.

Owner shall remove all loose furniture, appliances, and loose furnishings prior to handover of the facility to the Contractor.

Owner shall remove all interior building signage prior to handover of the facility to the Contractor.

### General Notes to Removals Plans:

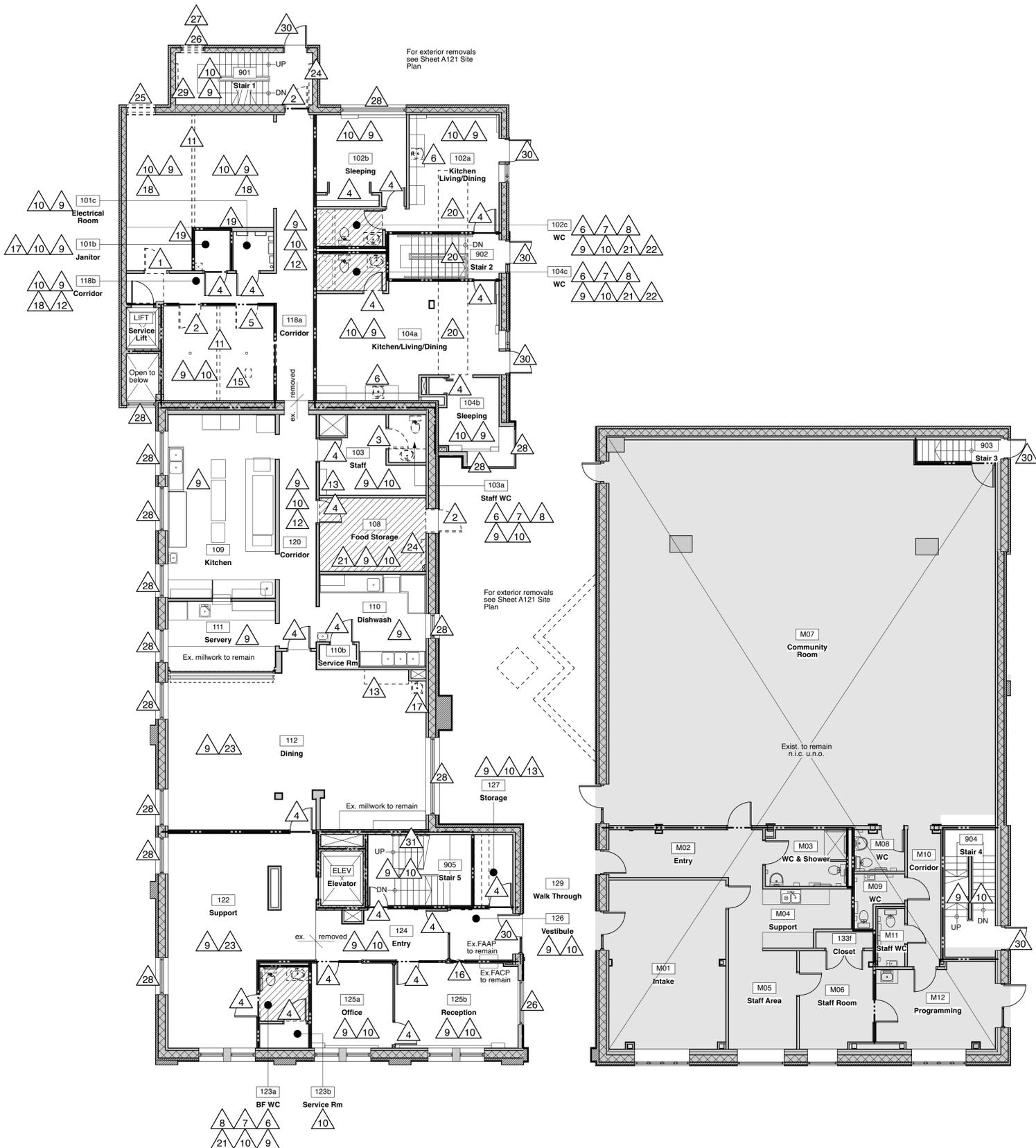
Not all existing floor slab removals are shown. All such removals are included in the Contract. See also Mechanical Documents for extent of below slab plumbing requirements.

Not all existing ceiling system removals are shown. All such removals required to perform the Work are included in the Contract Price. See also Architectural Reflected Ceiling Plans & the Mechanical and Electrical Documents.

Note that new penetrations through existing roof structure, to accommodate new mechanical and electrical are not shown. All such penetrations required to perform the Work are included in the Contract Price. See also Mechanical and Electrical Documents.

### General Notes to Lockset Removals:

All existing locksets that are keyed to the Owner's Best system, and that are scheduled for removal, shall be turned over to the Owner. DO NOT DISPOSE.



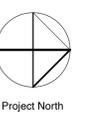
1  
A202 Ground Floor Removals Plan  
1/8" = 1'-0"

No.	Issued for Purpose	Date	Initial
1	30% Check Set	Dec. 05 '24	MM
2	90% Check Set	Dec. 12 '24	MM
T	For Tender	Dec. 19 '24	MM

### General Notes:

- For Cover and General Notes see Sheet A001
- For OBC Matrix and Information see Sheet A011
- For WC Accessories OBC Requirements see Sheet A012
- For Assembly Types see Sheet A021
- For Sequence of Construction see Sheet A031
- For Site Plan see Sheet A121
- For Floor Plan Removals see A200 series Sheets
- For Floor Plans see A210 series Sheets
- For Roof Plan see Sheet A215
- For Roof Assembly Types see Sheet A215
- For Floor Finishes Plans see A230 series Sheets
- For Building Elevations see A300 series Sheets
- For Window Schedules see Sheet A311
- For Window Coverings Schedule see Sheet A321
- For Reflected Ceiling Plans see A500 series Sheets
- For Ceiling Assembly Types see Sheet A501
- For Wall Sections see A600 series Sheets
- For Stair Plans, & Sections see A700 series Sheets
- For Millwork see A710 series Sheets
- For Openings Schedules see A900 series Sheets
- For Room Finishes Schedules see A910 series Sheets
- For Owner Equipment Schedule see Sheet A921

For Mechanical Drawings see M series Sheets  
For Electrical Drawings see E series Sheets



No.	Revision	Date	Initial

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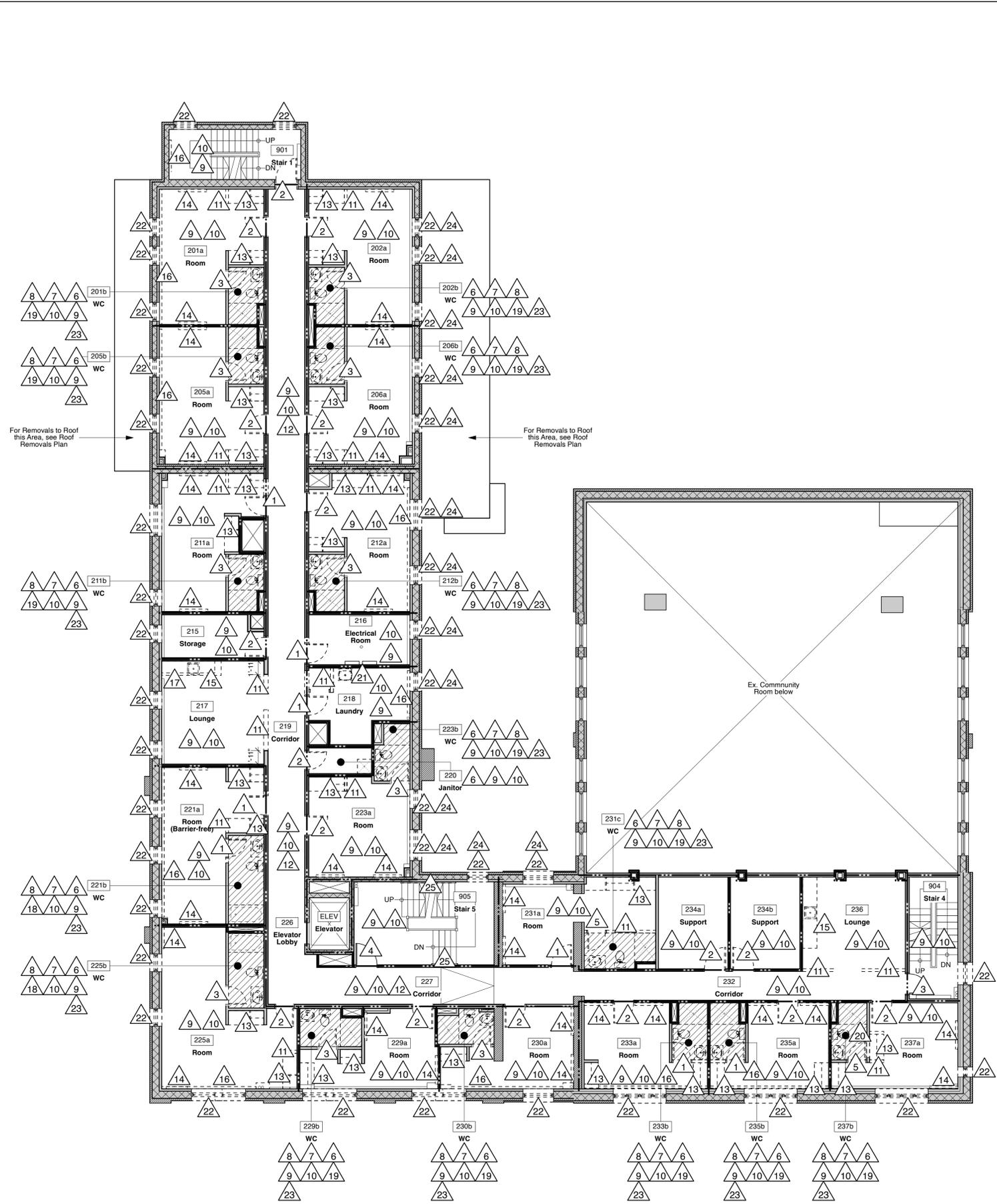
Approved	AD
Checked	MM
Drawing Title	Drawn AJ

**Ground Floor  
Removals Plan**

Scale (for 24x36" printing) Dwg. No.  
1/8" = 1'-0" A202

**John MacDonald Architect inc**

195 King Street West, Suite 202 Kitchener, ON N2G 1B1  
info@johndonaldarchitect.ca (519) 579 1700



**Notes to Second Floor Removals:**

- 1. Remove door, frame, and hardware complete, and dispose. Enlarge the opening to suit new frame or relocate door to suit new layout. See Openings Schedule and Floor Plans.
- 2. Remove door, frame, and hardware complete, and dispose. Prep opening for new frame. See Openings Schedule.
- 3. Remove door and hardware, and dispose. Existing frame to remain, prep for new door. See Openings Schedule.
- 4. Remove hardware as per Opening Schedule. Prep existing frame and door for new hardware.
- 5. Remove door, frame and hardware completely, and dispose.
- 6. Remove plumbing fixture, and dispose. Prep for new fixture.
- 7. Remove vanity c/w sink and trim, and dispose. Make good surfaces.
- 8. Remove all washrooms accessories, and dispose.
- 9. Disconnect and remove light fixtures in accordance with Electrical Lighting Plan. Job check existing circuiting. All disconnects, modifications to wiring, reconstructions are included in the Contract Price. See also Electrical Documents.
- 10. Remove and dispose floor finish c/w base and make good all wood subfloors and wall substrates to receive new finish. See Room Finishes Schedule.
- 11. Remove partitions, and dispose. Make good all subfloors and wall substrates to receive new finish. See Room Finishes Schedule.
- 12. Remove LAP ceiling grid, and dispose.
- 13. Remove millwork, and dispose. Make good surfaces.
- 14. Remove wall mounted light fixtures, and dispose. Make wiring safe.
- 15. Remove millwork c/w sink and countertop, and dispose. Make good all subfloors and wall substrates to receive new finish. See Room Finishes Schedule.
- 16. Remove baseboard heater, and dispose. See Mechanical Documents.
- 17. Remove bulkhead and exhaust system, and dispose. Make good all wall and ceiling substrates to receive new finish. See Room Finishes Schedule.
- 18. Remove bath tub c/w trim, and dispose. Make good surface, and prep for new shower unit.
- 19. Remove shower unit c/w trim, and dispose. Make good surface, and prep for new shower unit.
- 20. Remove portion of interior wall assembly as required to suit new Openings Schedule.
- 21. Remove plumbing fixture, and dispose. Make good surfaces to receive new finish. See Room Finishes Schedule.
- 22. Remove window unit c/w interior sill, and dispose. Prep opening for new window and sill.
- 23. Abate and remediate all mould, mildew, and water damaged subfloor. Repair and replace as may be required. Area shown hatched.
- 24. Remove plywood protection, store, and reinstall after installation of new window. Following completions of the renovations, and just prior to handover to the Owner for Occupancy, remove the temporary plywood protection from window, and dispose.
- 25. Remove handrails, and dispose. Make good surfaces.

**Legend:**

- Building Elevation  
See A300 series Sheets
- Building Section  
See A400 series Sheets
- Wall Section  
See A600 series Sheets
- Foundation Wall Type, Wall Type  
See A000 series Sheets
- Floor Types, see A000 series Sheets  
Room Types, see Sheet A215
- Partition Type  
See A000 series Sheets
- Ceiling Type  
See Sheet A501
- Room Numbers  
See Room Finish Schedule(s)
- Opening Numbers  
See Opening Schedule(s)
- Window Type, see A300 series Sheets  
for Window Schedule(s)
- Millwork Type  
See A710 series Sheets
- Owner Equipment Numbers  
See Equipment Schedule(s)
- Denotes Existing Assembly
- Denotes Fire Separation
- F.S. Denotes Fire Separation
- Denotes Fire Resistance Rating  
which must be confirmed onsite

**General Notes to Removals:**

Not all removals are shown. Carefully examine existing conditions and the documents, including the site plans and the reference documents. Perform all removals and alterations required to perform the Work. Perform all demolition in accordance with construction sequencing requirements.

Provide all cutting and patching required for the structural, mechanical and electrical work for this contract. Coordinate requirements and costs with Trade Contractors. All costs for this work are included in the Contract Price.

Dashed lines indicate items for removal. Dispose as noted. Salvage as noted. Turn over to Owner as noted.

For Structural removals, see also Structural Documents.  
For Mechanical removals, see also Mechanical Documents.  
For Electrical removals, see also Electrical Documents.

Owner shall remove all loose furniture, appliances, and loose furnishings prior to handover of the facility to the Contractor.

Owner shall remove all interior building signage prior to handover of the facility to the Contractor.

**General Notes to Removals Plans:**

Not all existing floor slab removals are shown. All such removals are included in the Contract. See also Mechanical Documents for extent of below slab plumbing requirements.

Not all existing ceiling system removals are shown. All such removals required to perform the Work are included in the Contract Price. See also Architectural Reflected Ceiling Plans & the Mechanical and Electrical Documents.

Note that new penetrations through existing roof structure, to accommodate new mechanical and electrical are not shown. All such penetrations required to perform the Work are included in the Contract Price. See also Mechanical and Electrical Documents.

**General Notes to Lockset Removals:**

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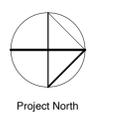
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For WC Accessories OBC Requirements see Sheet A012  
For Assembly Types see Sheet A021  
For Sequence of Construction see Sheet A031  
For Site Plan see Sheet A121  
For Floor Plan Removals see A200 series Sheets  
For Floor Plans see A210 series Sheets  
For Roof Plan see Sheet A215  
For Roof Assembly Types see Sheet A215  
For Floor Finishes Plans see A230 series Sheets  
For Building Elevations see A300 series Sheets  
For Window Schedules see Sheet A311  
For Window Coverings Schedule see Sheet A321  
For Reflected Ceiling Plans see A500 series Sheets  
For Ceiling Assembly Types see Sheet A501  
For Wall Sections see A600 series Sheets  
For Stair Plans, & Sections see A700 series Sheets  
For Millwork see A710 series Sheets  
For Openings Schedules see A900 series Sheets  
For Room Finishes Schedules see A910 series Sheets  
For Owner Equipment Schedule see Sheet A921  
For Mechanical Drawings see M series Sheets  
For Electrical Drawings see E series Sheets



No.	Revision	Date	Initial

**Project**  
RoW - 84 Frederick St.  
Renovation & Renewal  
84 Frederick St  
Kitchener, ON

Drawing Title	Approved	Checked	Drawn
	AD	MM	AJ

**Second Floor Removals Plan**

Scale (for 24x36" printing) 1/8" = 1'-0"  
Dwg. No. **A203**

**John MacDonald Architect inc**

195 King Street West, Suite 202 Kitchener, ON N2G 1B1  
info@jhmcdonaldarchitect.ca (519) 579 1700

**1**  
A203 Second Floor Removals Plan  
1/8" = 1'-0"

**Notes to Third Floor Removals:**

1. Remove door, frame, and hardware complete, and dispose. Enlarge the opening to suit new frame or relocate door to suit new layout. See Openings Schedule and Floor Plans.
2. Remove door, frame, and hardware complete, and dispose. Prep opening for new frame. See Openings Schedule.
3. Remove door and hardware, and dispose. Existing frame to remain, prep for new door. See Openings Schedule.
4. Remove hardware as per Opening Schedule. Prep existing frame and door for new hardware.
5. Remove door, frame and hardware completely, and dispose.
6. Remove plumbing fixture, and dispose. Prep for new fixture.
7. Remove vanity c/w sink and trim, and dispose. Make good surfaces.
8. Remove all washrooms accessories, and dispose.
9. Disconnect and remove light fixtures in accordance with Electrical Lighting Plan. Job check existing circuiting. All disconnects, modifications to wiring, reconections are included in the Contract Price. See also Electrical documents.
10. Remove and dispose floor finish c/w base and make good all wood subfloors and wall substrates to receive new finish. See Room Finishes Schedule.
11. Remove partitions, and dispose. Make good all subfloors and wall substrates to receive new finish. See Room Finishes Schedule.
12. Remove LAP ceiling grid, and dispose.
13. Remove millwork, and dispose. Make good surfaces.
14. Remove wall mounted light fixtures, and dispose. Make wiring safe.
15. Remove millwork c/w sink and countertop, and dispose. Make good all subfloors and wall substrates to receive new finish. See Room Finishes Schedule.
16. Remove baseboard heater, and dispose. See Mechanical Documents.
17. Remove bulkhead and exhaust system, and dispose. Make good all wall and ceiling substrates to receive new finish. See Room Finishes Schedule.
18. Remove bath tub c/w trim, and dispose. Make good surface, and prep for new shower unit.
19. Remove shower unit c/w trim, and dispose. Make good surface, and prep for new shower unit.
20. Remove toilet partitions, and dispose. Make good surfaces for installation of new toilet partitions.
21. Remove handrails, and dispose. Make good surfaces.
22. Remove plumbing fixture, and dispose. Make good surfaces to receive new finish. See Room Finishes Schedule.
23. Remove window unit c/w interior sill, and dispose. Prep opening for new window and sill.
24. Abate and remediate all mould, mildew, and water damaged subfloor. Repair and replace as may be required. Area shown hatched.
25. Remove wooden steps, and dispose. Make good surfaces.
26. Remove and reinstall existing hardware as required to suit new hardware and access control system requirements. See also Opening Schedule and Electrical Documents.

**Legend:**

- 1 A301 Building Elevation See A300 series Sheets
- 1 A401 Building Section See A400 series Sheets
- 1 A601 Wall Section See A600 series Sheets
- WF Foundation Wall Type, Wall Type See A000 series Sheets
- 1F Floor Types, see A000 series Sheets Room Types, see Sheet A215
- 1P Partition Type See A000 series Sheets
- 1C Ceiling Type See Sheet A501
- 07 Room Numbers See Room Finish Schedule(s)
- 10 Opening Numbers See Opening Schedule(s)
- Wxx Window Type, see A300 Series Sheets for Window Schedule(s)
- Mxx Millwork Type See A710 series Sheets
- 1.1 Owner Equipment Numbers See Equipment Schedule(s)
- Denotes Existing Assembly
- Denotes Fire Separation
- F.S. Denotes Fire Separation
- F.R.R. Denotes Fire Resistance Rating
- j.c. job check indicates dimension which must be confirmed onsite

**General Notes to Removals:**

Not all removals are shown. Carefully examine existing conditions and the documents, including the site plans and the reference documents. Perform all removals and alterations required to perform the Work. Perform all demolition in accordance with construction sequencing requirements.

Provide all cutting and patching required for the structural, mechanical and electrical work for this contract. Coordinate requirements and costs with Trade Contractors. All costs for this work are included in the Contract Price.

Dashed lines indicate items for removal. Dispose as noted. Salvage as noted. Turn over to Owner as noted.

For Structural removals, see also Structural Documents. For Mechanical removals, see also Mechanical Documents. For Electrical removals, see also Electrical Documents.

Owner shall remove all loose furniture, appliances, and loose furnishings prior to handover of the facility to the Contractor.

Owner shall remove all interior building signage prior to handover of the facility to the Contractor.

**General Notes to Removals Plans:**

Not all existing floor slab removals are shown. All such removals are included in the Contract. See also Mechanical Documents for extent of below slab plumbing requirements.

Not all existing ceiling system removals are shown. All such removals required to perform the Work are included in the Contract Price. See also Architectural Reflected Ceiling Plans & the Mechanical and Electrical Documents.

Note that new penetrations through existing roof structure, to accommodate new mechanical and electrical are not shown. All such penetrations required to perform the Work are included in the Contract Price. See also Mechanical and Electrical Documents.

**General Notes to Lockset Removals:**

All existing locksets that are keyed to the Owner's Best system, and that are scheduled for removal, shall be turned over to the Owner. DO NOT DISPOSE.

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2	90% Check Set	Dec. 12 '24	MM
T	For Tender	Dec. 19 '24	MM

**General Notes:**

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 For WC Accessories OBC Requirements see Sheet A012  
 For Assembly Types see Sheet A021  
 For Sequence of Construction see Sheet A031  
 For Site Plan see Sheet A121  
 For Floor Plan Removals see A200 series Sheets  
 For Floor Plans see A210 series Sheets  
 For Roof Plan see Sheet A215  
 For Roof Assembly Types see Sheet A215  
 For Floor Finishes Plans see A230 series Sheets  
 For Building Elevations see A300 series Sheets  
 For Window Schedules see Sheet A311  
 For Window Coverings Schedule see Sheet A321  
 For Reflected Ceiling Plans see A500 series Sheets  
 For Ceiling Assembly Types see Sheet A501  
 For Wall Sections see A600 series Sheets  
 For Stair Plans, & Sections see A700 series Sheets  
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 For Openings Schedules see A900 series Sheets  
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 For Owner Equipment Schedule see Sheet A921

For Mechanical Drawings see M series Sheets  
 For Electrical Drawings see E series Sheets



No.	Revision	Date	Initial

**Project**  
 RoW - 84 Frederick St.  
 Renovation & Renewal  
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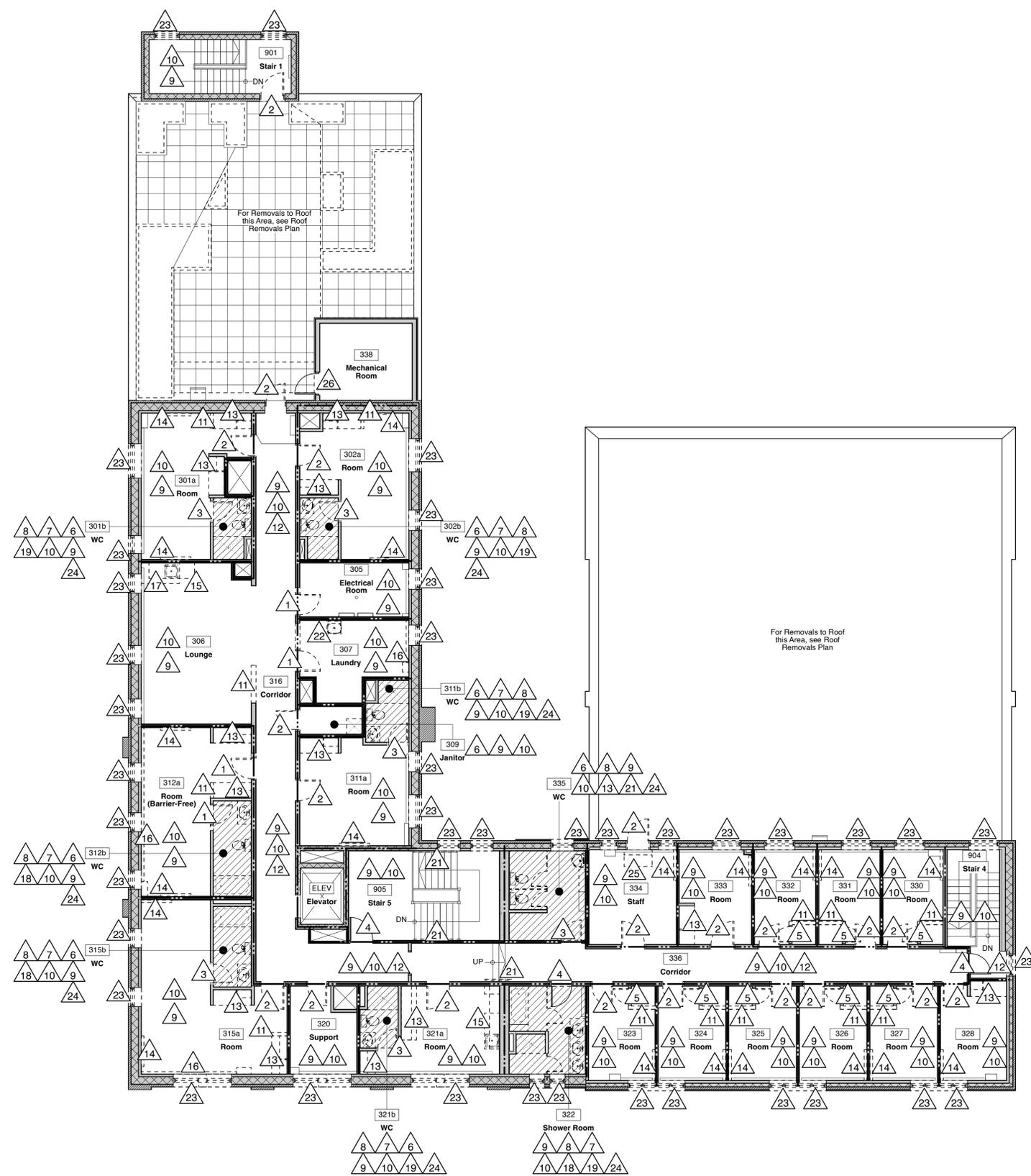
Approved	AD
Checked	MM
Drawing Title	Drawn AJ

**Third Floor  
 Removals Plan**

Scale (for 24x36" printing) Dwg. No.  
 1/8" = 1'-0" **A204**

**John MacDonald Architect inc**

195 King Street West, Suite 202 Kitchener, ON N2G 1B1  
 info@johndonaldarchitect.ca (519) 579 1700



1 Third Floor Removals Plan  
 A204 1/8" = 1'-0"

**Notes to Roof Removals:**

- 1. Remove concrete pavers, and dispose.
- 2. Remove wood guard, gate and fence, in its entirety, and dispose.
- 3. Remove wood deck structure in its entirety, and dispose.
- 4. Remove planter beds in their entirety, and dispose.
- 5. Remove roofing membrane and components down to decking c/w parapet cap flashing, and dispose.
- 6. Remove HVAC equipment, clean, store for reinstallation after roofing installation. Repair roof curbs as necessary.
- 7. Remove eavestrough c/w flashing and RWL, and dispose.
- 8. Remove scupper c/w RWL, and dispose. Prep to receive new scupper. See Roof Plan.
- 9. Remove scupper c/w RWL, and dispose. Repair parapet.
- 10. Remove portion of parapet for new scupper. See Roof Plan.
- 11. Remove roof drain, and dispose. Prep for installation of new roof drain. See Roof Plan and Mech. documents.
- 12. Remove eavestrough c/w flashing, RWL roof overhang and soffit, and dispose. Prep for new parapet wall.
- 13. Remove soffit at decorative cornice, and dispose. Prep for new soffit installation.
- 14. Remove existing supports for former roof top equipment, typ. of 4 (four), and dispose.
- 15. Remove roof attic vent, typ. of 5 (five), and dispose. Prep for new vents.
- 16. Remove abandoned gas pipe, and dispose.

**Legend:**

- 1 A301 Building Elevation See A300 series Sheets
- 1 A401 Building Section See A400 series Sheets
- 1 A601 Wall Section See A600 series Sheets
- WF Foundation Wall Type, Wall Type See A000 series Sheets
- 1F Floor Types, see A000 series Sheets Roof Types, see Sheet A215
- PF Partition Type See A000 series Sheets
- CD Ceiling Type See Sheet A501
- 07 Room Numbers See Room Finish Schedule(s)
- 10 Opening Numbers See Opening Schedule(s)
- Wxx Window Type, see A300 Sheets for Window Schedule(s)
- Mxx Millwork Type See A710 series Sheets
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For Ceiling Assembly Types see Sheet A501  
For Window Coverings Schedule see Sheet A321  
For Reflected Ceiling Plans see A500 series Sheets  
For Ceiling Assembly Types see Sheet A501  
For Wall Sections see A600 series Sheets  
For Stair Plans, & Sections see A700 series Sheets  
For Millwork see A710 series Sheets  
For Openings Schedules see A900 series Sheets  
For Room Finishes Schedules see A910 series Sheets  
For Owner Equipment Schedule see Sheet A921

For Mechanical Drawings see M series Sheets  
For Electrical Drawings see E series Sheets



No.	Revision	Date	Initial

**Project**  
RoW - 84 Frederick St.  
Renovation & Renewal  
84 Frederick St  
Kitchener, ON

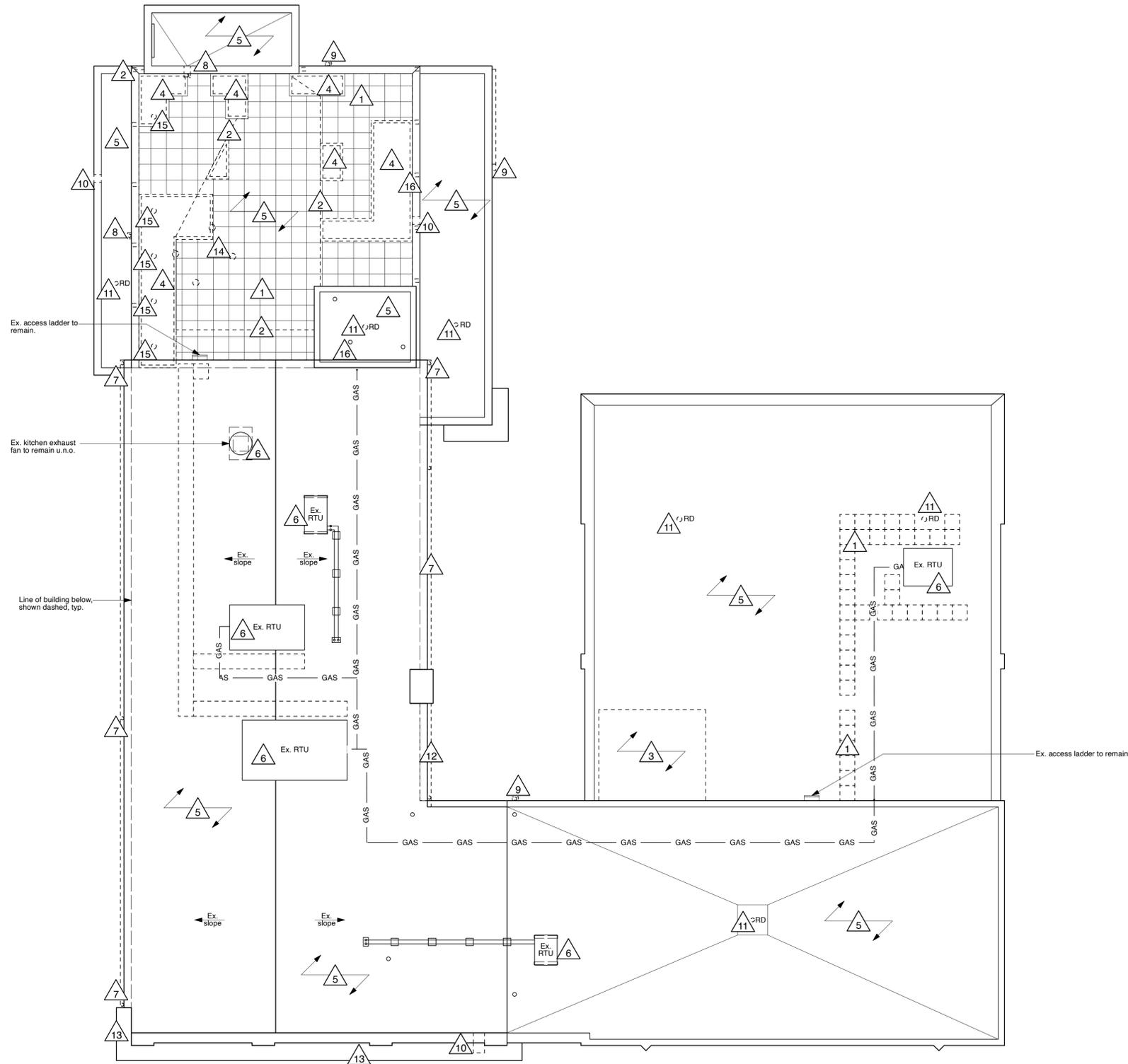
Approved	AD
Checked	MM
Drawing Title	Drawn AJ

**Roof Removals Plan**

Scale (for 24x36" printing) 1/8" = 1'-0"  
Dwg. No. A205

**John MacDonald Architect inc**

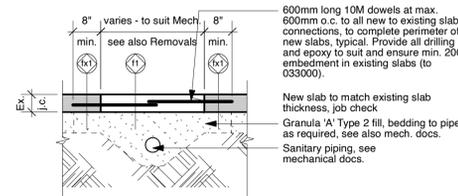
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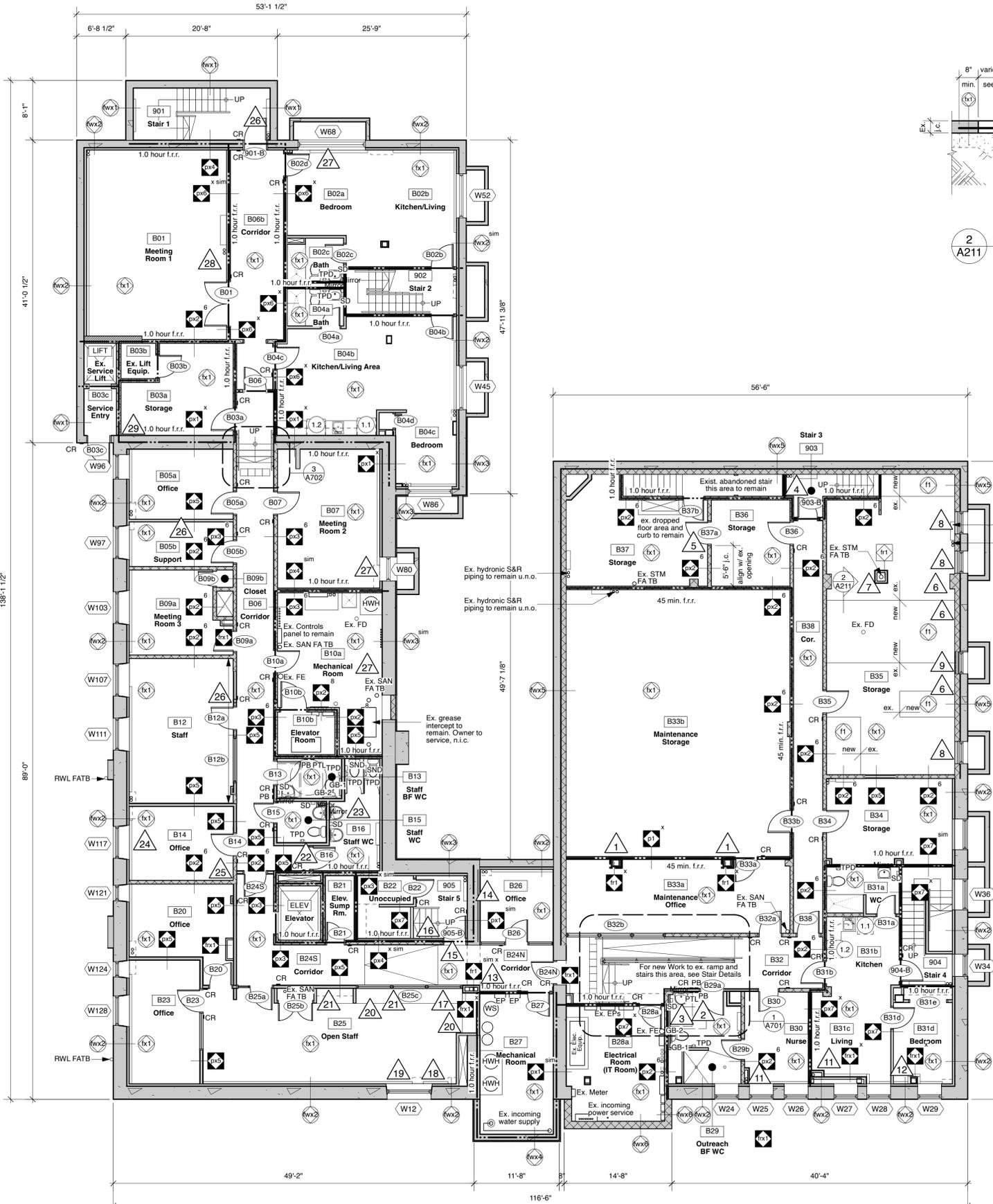
1 A205 Roof Removals Plan  
1/8" = 1'-0"

Notes to Basement Floor Plan:

- 1 Provide new 2 (two) layers 5/8" type X wallboard on 1 5/8" steel studs to form 1.0 hour f.r.r. to complete surround of existing steel HSS columns (to 092000). Locate studs at each corner of the column, and frame and board in accordance with OBC MNAH Supplementary Standard SB-2 Fire Performance Ratings. Firestop complete perimeter (to 078400). Install such rated surrounds prior to installation of adjacent new rated partition.
- 2 Provide new opening in to existing WC, to be located as far to the north as possible within the space. Modify existing partition wallboard and framing as may be required, and provide new infill to match existing. Existing partition is assumed to be 2 (two) layers 5/8" type X wallboard on 3 5/8" steel studs at maximum 16" o.c. job check.
- 3 Route new plumbing to/from new lavatory this location within adjacent partition, to connect with existing SAN at former lavatory position. See also Mechanical Documents. Costs to install new soap dispenser (SD), paper towel dispenser (PTD), and mirror supplied by Owner, are included in the Contract Price. Provide blocking (to 061000) in new partition to suit. Provide new Code compliant grab bars to water closet (to 102800). Remove existing grab bars and dispose.
- 4 Provide new 1.0 hour rated partition infill to existing door opening this location, to fully separate Exit Stair 3 from adjacent corridor area.
- 5 Provide new steel lintel at new opening in existing concrete block partition. Lintel shall consist of 2 (two) 6 x 2 1/2 x 1/2 angles for 6" nominal concrete block wall thickness, or 2 (two) 6 x 3 1/2 x 1/2 angles for nominal 8" block wall thickness. Provide temporary shoring as may be required for installation of lintel. Modify block-work to suit including blocks at headers and jamps.
- 6 Patch and make good existing concrete block with new, following removal of existing block partitions. See also Removals Plans.
- 7 Existing RWL to remain. Contractor shall camera existing below grade piping. Mark as-builts with pipe routing, and report to Owner and Consultant Condition.
- 8 Existing infill to former window rough opening to remain.
- 9 Replace existing infill of former window rough opening with new, consisting of new sheathing, framing, rigid insulation, weather barriers, wallboard to interior and new paint finishes.
- 10 Contractor and Mechanical Plumbing Trade Contractor shall job check condition and routing of all existing SAN system piping this area, including all inflow and outflow piping, and all above and below grade piping so as to create a complete understanding of the existing conditions. Coordinate and remove all SAN piping that is no longer required following removal of all former washroom and shower fixtures in this area. Maintain only venting and other piping required by other systems. Mark as-builts to suit.
- 11 Provide furring type "fr1" to completely enclose hydronic piping, for full height of piping. Provide access hatch for controls and drain down.
- 12 Patch and make good gwb to column surround.
- 13 Remove all existing furring this location that has been damaged by water ingress and migration from breezeway above. Provide all removals as required to completely expose existing 2 (two) HSS posts as well as the 2 (two) W8 steel beams above. Provide all furring and wallboard removals as additionally required to facilitate removal of existing salt and rust from all sides of steel beams and posts. Paint all steel with zinc rich galvanizing paint. See also Section Details. Replace all furring with new to match existing, and minimum 2 (two) layers type X wallboard on 2 1/2" steel studs, to achieve 1.0 hour fire resistance rated enclosure to the steel.
- 14 Remove all existing wallboard this location that has been damaged by water ingress and migration from breezeway above. Provide all removals as required to completely expose the bearing ends of 2 (two) W8 steel beams above, and as required to facilitate removal of existing salt and rust from all sides of steel beams and bearing plates. Report condition of steel to Consultant. Paint all steel with zinc rich galvanizing paint. See also Section Details. Replace all furring with new to match existing.
- 15 Provide safety yellow paint finish to step at door (to 099000).
- 16 Repair wood stringer at bottom of stairs, and make good stain finish to match existing (to 092000 & 099000).
- 17 Fire-stop ex. wiring penetrations through rated ceilings above, this location (to 078400).
- 18 Insulate and seal pipe penetration above window unit (to 072000 & 072500).
- 19 Make good damaged wallboard at u/s of bulkhead above window head (to 092000).
- 20 Existing countertops to remain. Patch and repair existing p.lam (to 064000).
- 21 Provide new paint finishes to existing p.lam millwork (bases, uppers, and all shelving). Remove all labels, provide all prep and priming as required to ensure paint adhesion. Provide new hardware pulls (to 064000).
- 22 Provide new infill framing and wallboard to gap above door to deck above (to 092000).
- 23 Remove wallboard damaged by water, along base of wall, for min. 2'-0" a.f.f. and provide new wallboard, taped, spackled, sanded and painted (to 092000 & 099000).
- 24 Provide enclosure to hydronic heating controls. See also Mechanical Docs.
- 25 Make good and seal electrical penetration at u/s of bulkhead (to 079000 & 099000).
- 26 Remove wallboard damaged by water from piping within bulkhead above. See also RCPs. Provide new wallboard, taped, spackled, sanded and painted (to 092000 & 099000).
- 27 Remove all interior components of the foundation wall assembly in order to expose the existing concrete foundation walls, in order to expose and identify source(s) of water ingress this location. Report to Consultant findings. Provide all new framing, insulation, vapour barrier and wallboard to make good exterior enclosure. All work to specifically address leaks (such as for example to fill cracks, or to install a new waterproofing membrane) are not in contract.
- 28 Remove all wallboard along interior face of existing partition, for full width of Room B01 (to 024111). Provide 2 (two) layers new 5/8" type X wallboard to make good existing fire separation and to ensure continuity of fire resistance rating. Firestop all penetrations (to 078400).
- 29 Remove all interior components of the foundation wall assembly in order to expose the existing concrete foundation walls, in order to expose and identify source(s) of water ingress this location. Report to Consultant findings. Provide all new framing, insulation, vapour barrier and wallboard to make good exterior enclosure. All work to specifically address leaks (such as for example to fill cracks, or to install a new waterproofing membrane) are not in contract.



2 Section Detail @ New to Exist. Slab Joint, Typ.  
A211 1/2" = 1'-0"



1 Basement Floor Plan  
A211 1/8" = 1'-0"

Legend:

- 1 Building Elevation See A300 series Sheets
- 1 Building Section See A400 series Sheets
- 1 Wall Section / Section Detail See A600 series Sheets
- WF Foundation Wall Type, Wall Type See A000 series Sheets
- FR Floor Types, see Sheet A012 Roof Types, see Sheet A215
- PT Partition Type See A000 series Sheets
- CR Ceiling Type See Sheet A501
- Room Numbers See Room Finish Schedule(s)
- Opening Numbers See Opening Schedule(s)
- Window Type, see A300 Sheets for Window Schedule(s)
- Mx Millwork Type See A710 series Sheets
- Owner Equipment Numbers See Equipment Schedule(s)
- Denotes Existing Assembly
- Denotes Fire Separation
- F.S. Denotes Fire Separation
- F.R.R. Denotes Fire Resistance Rating
- j.c. job check indicates dimension which must be confirmed onsite

General Notes to Floor Plans:

- Comply with Division One and General Requirements of the specifications, and the Conditions of the Contract, which form part of the accomplishment of the Work as if repeated here.
- Perform all work in strict conformance with the Construction Sequence, and to the Construction Schedule milestones.
- Extent of new concrete floor slabs not necessarily shown on Floor Plans. Refer to Removals Plans, and the Mechanical and Electrical Documents, and provide all new concrete slabs on grade to areas of existing slab removals, and where indicated or reasonably inferred, in accordance with Division 03 requirements.
- Extent of existing and new steel studs not shown. Refer to Assembly Types, Structural Documents and specifications. All framing members are required and form part of this Contract, regardless of whether shown this plan or not.
- Extent of thermal insulation(s) within assemblies is not shown on Floor Plans but may be required. Refer to Assembly Types, Details, and specifications for type, depth and extent of insulations. Insulations are required this Contract, in accordance with Sections 070300 & 072000, to form a complete and continuous thermal barrier system.
- Extent of acoustic insulation within assemblies is not shown on floor plans but may be required. Refer to Assembly Types and specifications. Acoustic insulation is required this Contract, in accordance with Sections 093500.
- Provide all repairs to existing wallboard (to 092000) required following removal of existing elements, including but not limited to at wall bases, existing and new openings, as may be required to ensure continuity of existing fire separations.
- For a complete list of required washroom accessories, see Section 102800. For mounting heights and positions of washroom accessories see Sheet A012. All washroom accessories are required to OBC. Provide blocking for all accessories.
- For Floor Finishes, see Floor Finishes Plans.
- Any furniture shown is for space planning purposes only. All furniture is by Owner.
- Equipment shown is for space planning purposes only and for layout of electrical power and devices. All equipment is provided by Owner unless specifically noted otherwise. Notwithstanding, Contractor shall provide blocking in assemblies as necessary to suit wall-mounted equipment, and any other surface mounted equipment supplied by the Owner for installation by this Contract. See also Section 110500.
- Provide all cutting and patching required for the mechanical and electrical work of this contract. Co-ordinate requirements and costs with trade contractors. All costs for this work are included in the Contract.
- Dimensions are clear dimensions to face of finished surface, unless noted otherwise.
- For layout of plumbing fixtures and washroom accessories in Universal Washrooms and Accessible washroom and shower areas, and abbreviations for washroom accessories throughout, see Sheet A012.

- BBH denotes Baseboard Heater, see Mech. & Elec. Docs
- CG denotes Corner Guards (see Finishes Plans)
- CR denotes access control system Card Reader
- EHD denotes Electric Hand Dryer, see also Elec. Docs
- FA denotes From Above
- FB denotes From Below
- FE denotes Fire Extinguisher
- FEC denotes Fire Extinguisher cabinet c/w extinguisher
- FPH denotes Fire Hose Puller, see Mech. & Elec. Docs
- GB denotes Grab Bar
- HSD denotes Hand Sanitizer Dispenser
- NFB denotes New Freeze Hose Bib
- OTA denotes Open to Above
- PB denotes Push Button
- PTD denotes Paper Towel Dispensers
- PTL denotes Push to Lock
- SD denotes Soap Dispensers
- SDU denotes Sharps Disposal Units
- SND denotes Sanitary Napkin Disposals
- TB denotes To Below
- TPD denotes Toilet Paper Dispensers

General Notes to Existing Wallboard & Interior Finishes System:

Notwithstanding the specific notes to floor plans, existing wallboard that is damaged, and that is visible in the finished Work, shall be made good (to 092000).

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The reader shall immediately notify the Architect of all inconsistencies, errors, or omissions which they may discover in this or other documents, or in their relation in whole or in part.

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3	Client Info & Review	Nov. 23 '24	MM
4	30% Check Set	Dec. 05 '24	MM
5	90% Check Set	Dec. 12 '24	MM
7	For Tender	Dec. 19 '24	MM

General Notes:

- For Cover and General Notes see Sheet A001
- For OBC Matrix and Information see Sheet A011
- For WC Accessories OBC Requirements see Sheet A012
- For Assembly Types see Sheet A021
- For Sequence of Construction see Sheet A031
- For Site Plan see Sheet A121
- For Floor Plan Removals see A200 series Sheets
- For Floor Plans see A210 series Sheets
- For Roof Plan see Sheet A215
- For Floor Finishes Plans see Sheet A215
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No.	Revision	Date	Initial

Project  
RoW - 84 Frederick St.  
Renovation & Renewal  
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Kitchener, ON

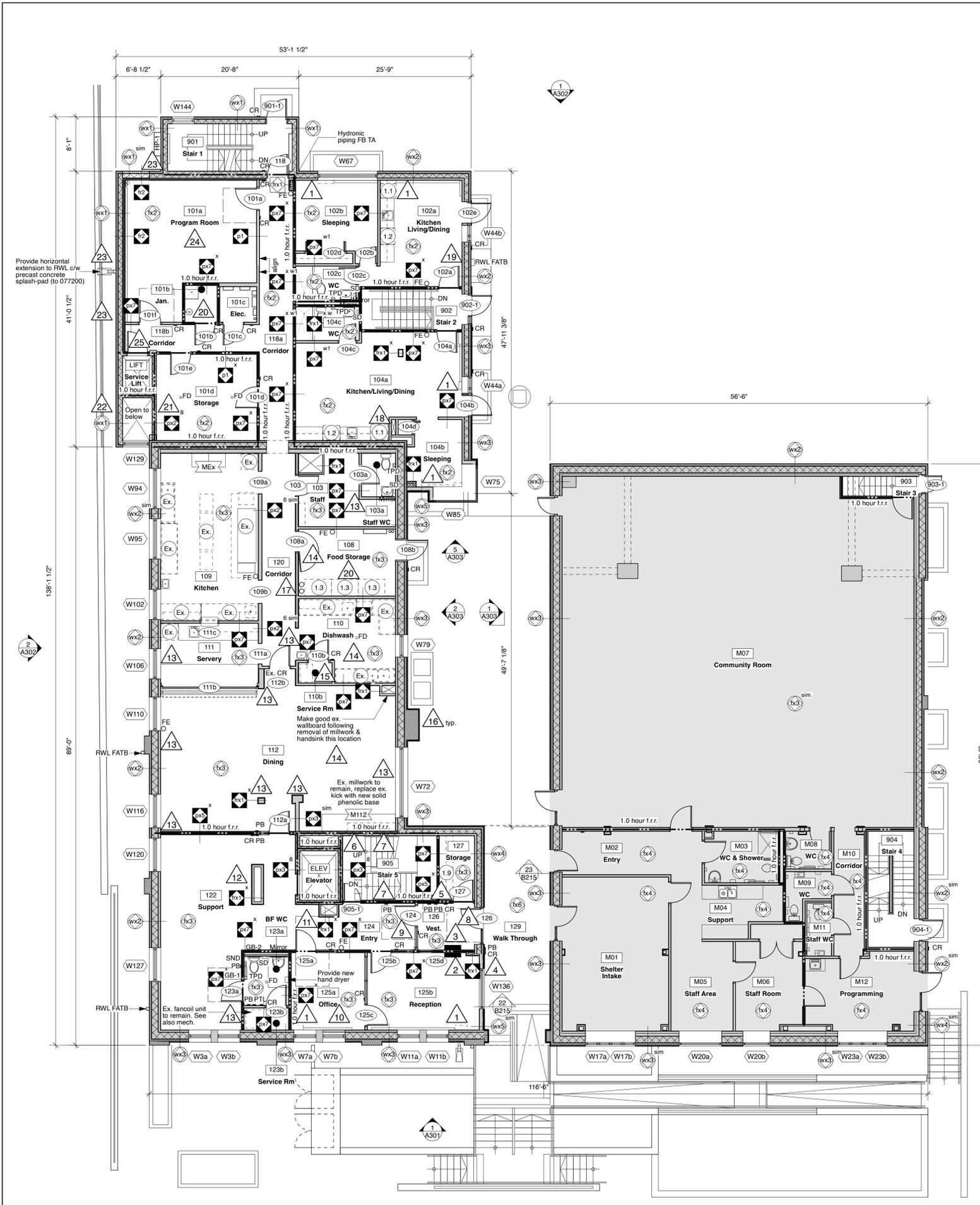
Drawing Title	Approved	AD
	Checked	MM
	Drawn	MM

Basement  
Floor Plan

Scale	Dwg. No.
(for 24x36" printing)	A211

John MacDonald Architect inc

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info@jhmcdonaldarchitect.ca (519) 579 1700



1  
A212  
Ground Floor Plan  
1/8" = 1'-0"

Notes to Ground Floor Plan:

1. Make good existing enclosure to hydronic controls.
2. Existing Fire Alarm control panel this location to remain.
3. Existing Fire Alarm annunciator panel to remain. Provide new passive fire alarm graphic adjacent panel. See also Electrical Docs.
4. Existing Owner's key box for fire fighting purposes to remain.
5. Provide blocking for Owner's shelving system, for full length of wall, from 2'-0" s.f.f. to 7'-0" s.f.f.
6. Remove existing wood chair rail and dispose. Make good existing plaster substrate prior to painting.
7. Provide new painted steel handrail c/w stanchion supports (to 057000 & 090000), along full length of existing stair flight. Handrail not shown this plan. Provide handrail in accordance with Detail 5/A701.
8. Make good wallboard each side of entry with new impact resistant wallboard, taped, spackled, and sanded (to 092000) and painted (to 093000).
9. Existing intercom system to remain, u.n.o.
10. Remove all existing wallboard and framing as required to uncover existing window opening. Make good opening and provide new wallboard to jambs and header (to 092000) and new p.lam sill (to 064000).
11. Remove and abate wallboard damaged by mold and/or water. Provide new wallboard, taped, spackled, and sanded (to 092000), and painted (to 093000).
12. Make good large hole in rated membrane of floor assembly above this location. See also assembly types.
13. Patch and make good wallboard this location (to 092000).
14. Remove and abate wallboard damaged by mold and/or water to ceiling space above LAP this area. Provide new wallboard, taped, spackled, and sanded (to 092000). Allow for min. sizes of removals and replacements. Fire-stop all penetrations and to perimeter of repairs (to 078400).
15. Make good condensate connection, provide new funnel floor drain, connected to nearest adjacent SAN. See also Mechanical Docs.
16. Remove bottom course of exterior cladding to complete perimeter of courtyard. Provide new through-wall flashing, and provide new horizontal siding. Paint all siding.
17. New zone conduit for communications systems FATB. See also Electrical Documents and section 280500.
18. Patch and make good wallboard following fridge pan removal (to 092000).
19. Make good subfloor at removed floor stop.
20. Provide new subfloor to complete room area, following removal and abatement of water and mould damaged substrates and finishes (to 061000). See also Removals and Floor Finishes Plans.
21. Infill existing concrete block with new, to match existing thickness, following removal of exhaust fan ductwork.
22. Infill and make good existing exterior brick masonry to match existing, and concrete block following removal of exhaust ductwork and exhaust cap.
23. Provide weather and thermal barrier connections to complete perimeter of new duct and pipe penetrations for new mechanical equipment this area (to 072000 & 072500). See also Mechanical Docs.
24. Notwithstanding any assembly type tags, all wallboard to the complete perimeter of this space shall be removed and provided new, taped, spackled, and sanded (to 092000), new paint finishes (to 093000).
25. Make good water damage to rated membrane above.

Notes to Window Sills:

Provide new sills to all windows (to 062000), and in accordance with sill details. See Floor Finishes Plans.

Legend:

- 1 Building Elevation See A300 series Sheets
- 1 Building Section See A400 series Sheets
- 1 Wall Section / Section Detail See A600 series Sheets
- WF Foundation Wall Type, Wall Type See A000 series Sheets
- FR Floor Types, see Sheet A012 Roof Types, see Sheet A215
- PT Partition Type See A000 series Sheets
- CR Ceiling Type See Sheet A501
- 07 Room Numbers See Room Finish Schedule(s)
- 10 Opening Numbers See Opening Schedule(s)
- Wxx Window Type, see A300 Series Sheets for Window Schedule(s)
- Mxx Millwork Type See A710 series Sheets
- 1.1 Owner Equipment Numbers See Equipment Schedule(s)
- Denotes Existing Assembly
- Denotes Fire Separation
- F.S. Denotes Fire Separation
- F.R.R. Denotes Fire Resistance Rating
- j.c. job check indicates dimension which must be confirmed onsite

General Notes to Floor Plans:

Comply with Division One and General Requirements of the specifications, and the Conditions of the Contract, which form part of the accomplishment of the Work as if repeated here.

**Perform all work in strict conformance with the Construction Sequence, and to the Construction Schedule milestones.**

Extent of new concrete floor slabs not necessarily shown on Floor Plans. Refer to Removals Plans, and the Mechanical and Electrical Documents, and provide all new concrete slabs on grade to areas of existing slab removals, and where indicated or reasonably inferred, in accordance with Division 03 requirements.

Extent of existing and new steel studs not shown. Refer to Assembly Types, Structural Documents and specifications. All framing members are required and form part of this Contract, regardless of whether shown this Plan or not.

Extent of thermal insulation(s) within assemblies is not shown on floor plans but may be required. Refer to Assembly Types, Details, and specifications for type, depth and extent of insulations. Insulations are required this Contract, in accordance with Sections 070500 & 072000, to form a complete and continuous thermal barrier system.

Extent of acoustic insulation within assemblies is not shown on floor plans but may be required. Refer to Assembly Types and specifications. Acoustic insulation is required this Contract, in accordance with Sections 090500.

Provide all repairs to existing wallboard (to 092000) required following removal of existing elements, including but not limited to at wall bases, existing and new openings, as may be required to ensure continuity of existing fire separations.

For a complete list of required washroom accessories, see Section 102800. For mounting heights and positions of washroom accessories see Sheet A012. All washroom accessories are required to OBC. Provide blocking for all accessories.

For Floor Finishes, see Floor Finishes Plans. Any furniture shown is for space planning purposes only. All furniture is by Owner.

Equipment shown is for space planning purposes only, and for layout of electrical power and devices. All equipment is provided by Owner unless specifically noted otherwise. Notwithstanding, Contractor shall provide blocking in assemblies as necessary to suit wall-mounted equipment, and any other surface mounted equipment supplied by the Owner for installation by this Contract. See also Section 110500.

Provide all cutting and patching required for the mechanical and electrical work of this contract. Co-ordinate requirements and costs with trade contractors. All costs for this work are included in the Contract.

Dimensions are clear dimensions to face of finished surface, unless noted otherwise.

For layout of plumbing fixtures and washroom accessories in Universal Washrooms and Accessible washroom and shower areas, and abbreviations for washroom accessories throughout, see Sheet A012.

- BBH denotes Baseboard Heater, see Mech. & Elec. Docs
- CG denotes Corner Guards (see Finishes Plans)
- CR denotes access control system Card Reader
- EHD denotes Electric Hand Dryer, see also Elec. Docs.
- FA denotes From Above
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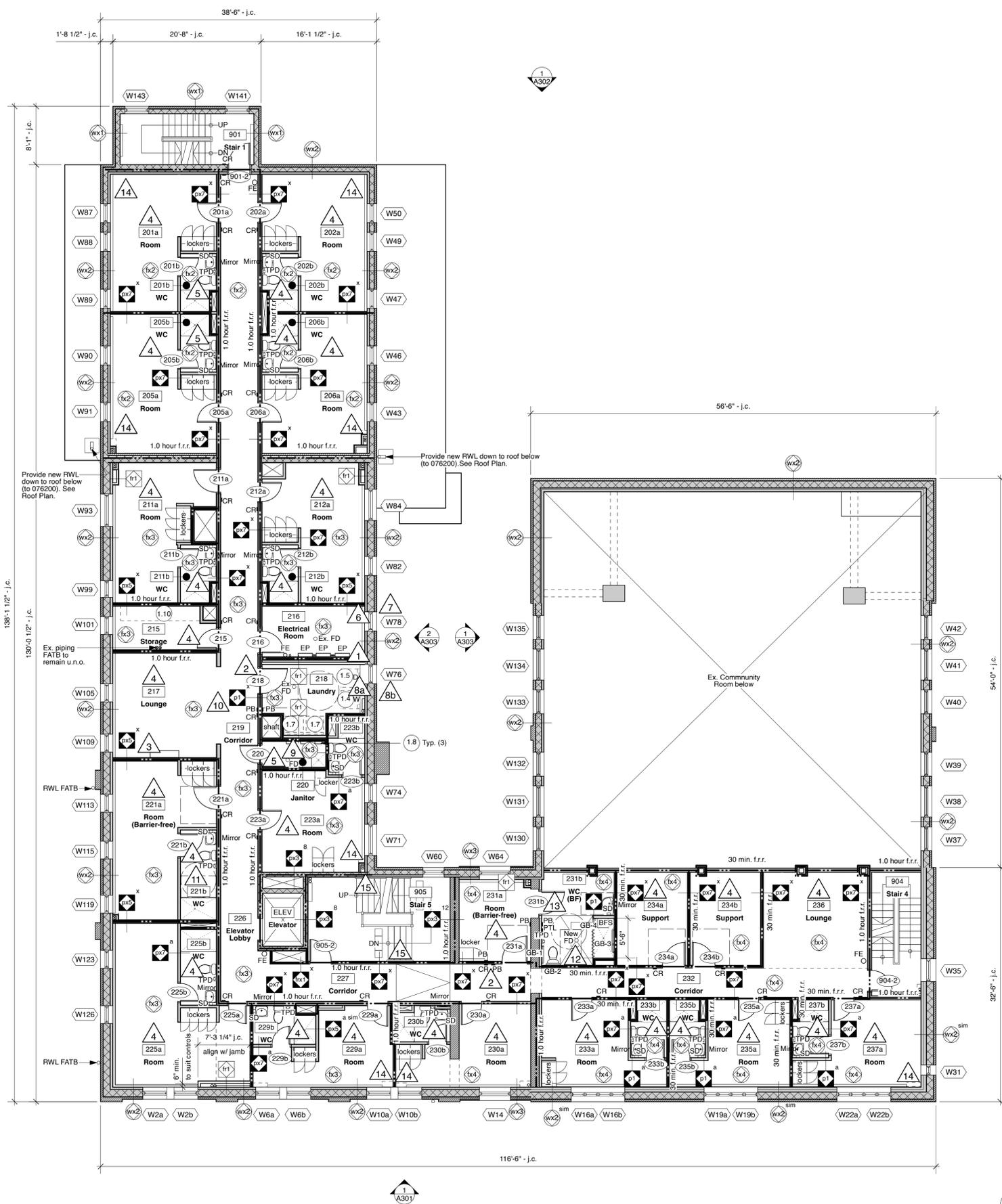
Drawing Title	

**Ground Floor Plan**

Scale (for 24x36" printing)	Dwg. No.
1/8" = 1'-0"	A212

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**Notes to Second Floor Plan:**

- 1. Provide new furring to complete length of Laundry room, for routing of new plumbing and electrical for laundry equipment. Furring shall be 3 5/8" steel studs with 5/8" moisture and impact resistance wallboard (to 092000). Provide new 3/4" solid wood sill c/w 1 1/2" bullnose leading edge (to 062000), painted (to 095000). Top of sill shall be at 5'-0" a.f.f. See also Mechanical and Electrical Documents.
- 2. Provide all modifications to existing rough opening as may be required to suit new opening frame and leaf, and all clearances for barrier-free accessibility. Provide hardwired push button controls, interlinked with Owner's card reader access controls. See also Schedules and Electrical Documents.
- 3. New split A/C unit. See also Mechanical Docs. All feeds shall not be exposed in the finished work.
- 4. Patch and repair wallboard (to 092000).
- 5. Replace all wallboard this room complete, with new impact resistant wallboard, taped, spackled, and sanded (to 092000).
- 6. Infill and make good existing thermal and weather barriers, and wallboard following removal of exhaust duct penetrations.
- 7. Infill and make good existing exterior brick masonry to match existing, and concrete block following removal of exhaust ductwork and exhaust cap (to Division 04). See also Mechanical Docs.
- 8a. Provide weather and thermal barrier connections to complete perimeter of new duct and pipe penetrations for new mechanical equipment this area (to 072000 & 072500). See also Mechanical Docs.
- 8b. Modify existing exterior mass masonry to suit new opening for new exhaust ductwork and exhaust cap. Provide lintels and reinforcing (to Division 04). See also Mechanical Docs.
- 9. Provide new subfloor to complete room area, following removal and abatement of water and mould damaged substrates and finishes (to 061000). See also Removals and Floor Finishes Plans.
- 10. Provide new built-up 2x12 wood lintel above opening c/w 2 jack and 2 king posts either side of enlarged opening.
- 11. Provide further subfloor layers and feathering as may be required to ensure max. 1/2" transition from new floor finishes to new prefabricated shower unit (to 061000 & 095500). See also Mechanical Docs.
- 12. Provide slope to drain.
- 13. Max. 5% slope to threshold from sleeping Room to WC (BF).
- 14. Make good enclosure to hydronic system valves and controls. See also Mech. Docs.
- 15. Provide new painted steel handrail c/w stanchion supports (to 057000 & 099000), along full length of existing stair flight. Handrail not shown this plan. Provide handrail in accordance with Detail SA701 and complete with all 12" horizontal extensions at tops and bottoms of stair flights.

**General Notes to Lockers:**

All Lockers are provided new this Contract, unless specifically noted otherwise.  
See also Section 105100.

**Legend:**

- 1 A301 Building Elevation See A300 series Sheets
- 1 A401 Building Section See A400 series Sheets
- 1 A601 Wall Section / Section Detail See A600 series Sheets
- WF Foundation Wall Type, Wall Type See A600 series Sheets
- FA Floor Types, see Sheet A012 Roof Types, see Sheet A215
- PF Partition Type See A600 series Sheets
- CA Ceiling Type See Sheet A501
- 07 Room Numbers See Room Finish Schedule(s)
- 10 Opening Numbers See Opening Schedule(s)
- Wxx Window Type, see A300 Series for Window Schedule(s)
- Mxx Millwork Type See A710 series Sheets
- 1.1 Owner Equipment Numbers See Equipment Schedule(s)
- Denotes Existing Assembly
- Denotes Fire Separation
- F.S. Denotes Fire Separation
- F.R.R. Denotes Fire Resistance Rating
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**General Notes to Floor Plans:**

Comply with Division One and General Requirements of the specifications, and the Conditions of the Contract, which form part of the accomplishment of the Work as if repeated here.

**Perform all work in strict conformance with the Construction Sequence, and to the Construction Schedule milestones.**

Extent of new concrete floor slabs not necessarily shown on Floor Plans. Refer to Removals Plans, and the Mechanical and Electrical Documents, and provide all new concrete slabs on grade to areas of existing slab removals, and where indicated or reasonably inferred, in accordance with Division 03 requirements.

Extent of existing and new steel studs not shown. Refer to Assembly Types, Structural Documents and specifications. All framing members are required and form part of this Contract, regardless of whether shown this Plan or not.

Extent of thermal insulation(s) within assemblies is not shown on Floor Plans but may be required. Refer to Assembly Types, Details, and specifications for type, depth and extent of insulations. Insulations are required this Contract, in accordance with Sections 070300 & 072000, to form a complete and continuous thermal barrier system.

Extent of acoustic insulation within assemblies is not shown on floor plans but may be required. Refer to Assembly Types and specifications. Acoustic insulation is required this Contract, in accordance with Sections 095500.

Provide all repairs to existing wallboard (to 092000) required following removal of existing elements, including but not limited to at wall bases, existing and new openings, as may be required to ensure continuity of existing fire separations.

For a complete list of required washroom accessories, see Section 102800. For mounting heights and positions of washroom accessories see Sheet A012. All washroom accessories are required to OBC. Provide blocking for all accessories.

For Floor Finishes, see Floor Finishes Plans.

Any furniture shown is for space planning purposes only. All furniture is by Owner.

Equipment shown is for space planning purposes only, and for layout of electrical power and devices. All equipment is provided by Owner unless specifically noted otherwise. Notwithstanding, Contractor shall provide blocking in assemblies as necessary to suit wall-mounted equipment, and any other surface mounted equipment supplied by the Owner for installation by this Contract. See also Section 110500.

Provide all cutting and patching required for the mechanical and electrical work of this contract. Co-ordinate requirements and costs with trade contractors. All costs for this work are included in the Contract.

Dimensions are clear dimensions to face of finished surface, unless noted otherwise.

For layout of plumbing fixtures and washroom accessories in Universal Washrooms and Accessible washroom and shower areas, and abbreviations for washroom accessories throughout, see Sheet A012.

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No.	Issued For Purpose	Date	Initial
1	Client Info	Sept 27 '24	MM
2	Window tag reference	Nov 15 '24	MM
3	Client Info & Review	Nov 23 '24	MM
4	30% Check Set	Dec 05 '24	MM
5	90% Check Set	Dec 12 '24	MM
T	For Tender	Dec 19 '24	MM

**General Notes:**

For Cover and General Notes see Sheet A001  
For OBC Matrix and Information see Sheet A011  
For WC Accessories OBC Requirements see Sheet A012  
For Assembly Types see Sheet A021  
For Sequence of Construction see Sheet A031  
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For Openings Schedules see A900 series Sheets  
For Room Finishes Schedules see A910 series Sheets  
For Owner Equipment Schedule see Sheet A921  
For Mechanical Drawings see M series Sheets  
For Electrical Drawings see E series Sheets



R1	Rooms & Beds	Oct. 02 '24	MM
No.	Revision	Date	Initial

**Project**  
RoW - 84 Frederick St.  
**Renovation & Renewal**  
84 Frederick St  
Kitchener, ON

	Approved	AD
	Checked	MM
Drawing Title	Drawn	MM

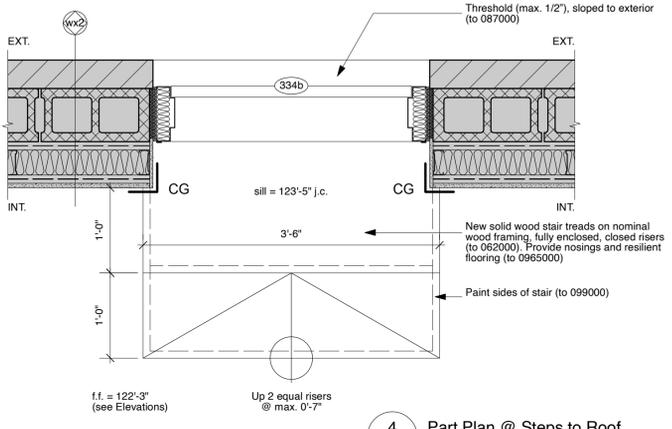
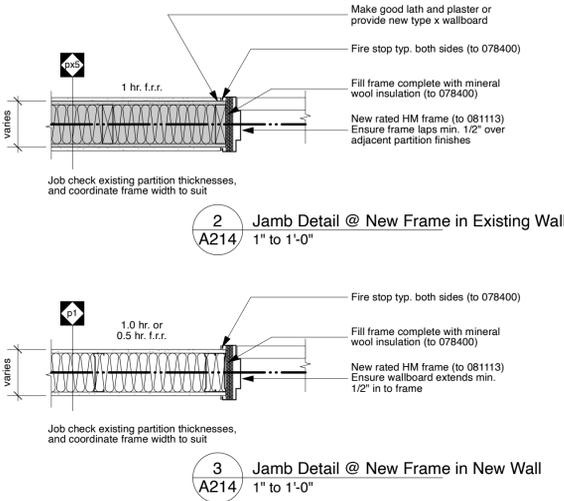
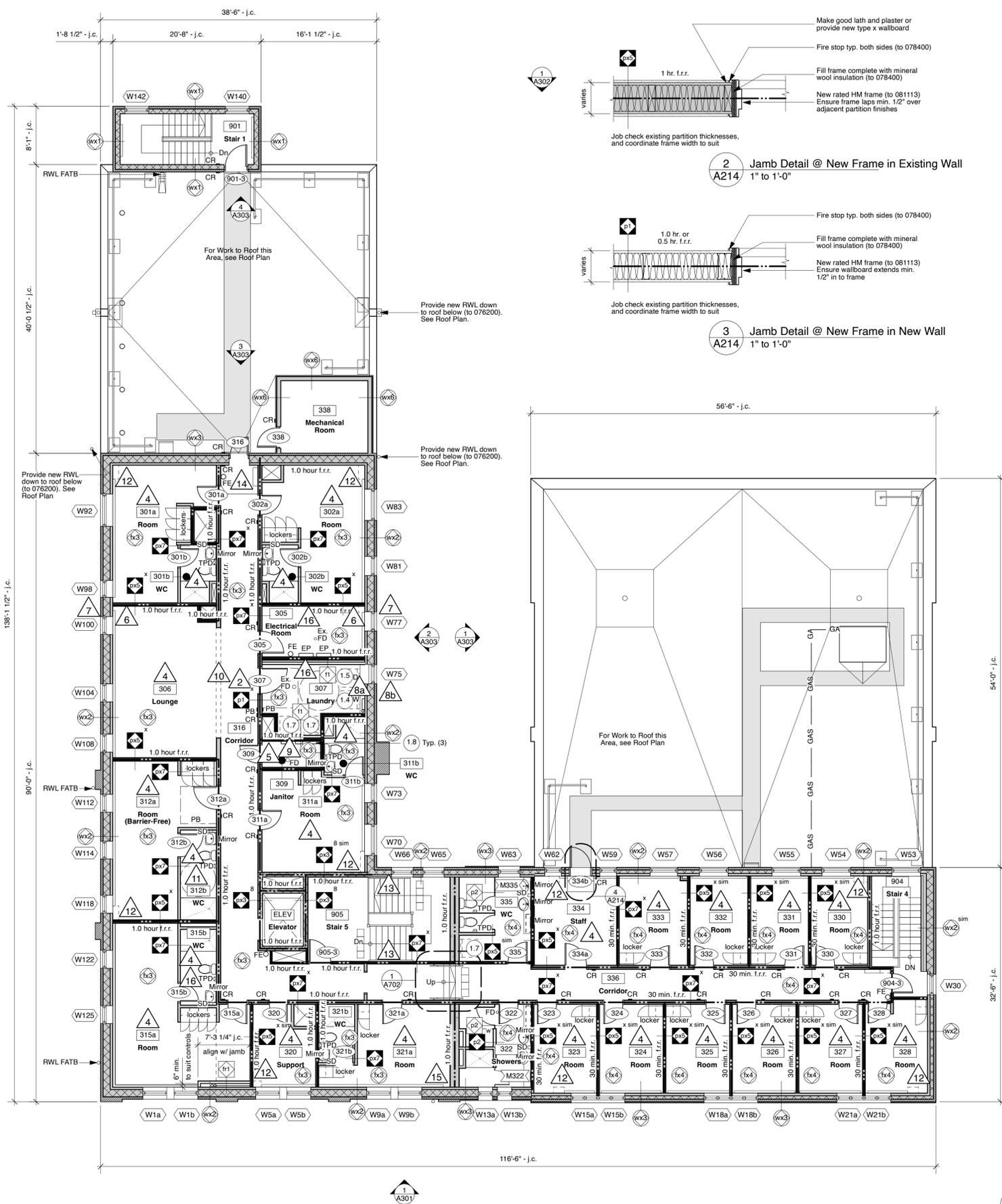
**Second Floor Plan**

Scale (for 24x36" printing) Dwg. No.  
1/8" = 1'-0" **A213**

**John MacDonald Architect inc**

195 King Street West, Suite 202 Kitchener, ON N2G 1B1  
info@jhmarchitect.com (519) 579 1700

1 A213 Second Floor Plan  
1/8" = 1'-0"



**Notes to Third Floor Plan:**

1. Provide new furring to complete length of Laundry room, for routing of new plumbing and electrical for laundry equipment. Furring shall be 3 5/8" steel studs with 5/8" moisture and impact resistance wallboard (to 092000). Provide new 3/4" solid wood sill c/w 1 1/2" bullnose leading edge (to 062000), painted (to 099000). Top of sill shall be as 5'-0" a.l.f. See also Mechanical and Electrical Documents.
2. Provide all modifications to existing rough opening as may be required to suit new opening frame and leaf, and all clearances for barrier-free accessibility. Provide hardwired push button controls, interlinked with Owner's care reader access controls. See also Schedules and Electrical Documents.
3. New split A/C unit. See also Mechanical Docs. All feeds shall not be exposed in the finished work.
4. Patch and repair wallboard (to 092000).
5. Replace all wallboard this room complete, with new impact resistant wallboard, taped, spackled, and sanded (to 092000).
6. Infill and make good existing thermal and weather barriers, and wallboard following removal of exhaust ductwork and exhaust cap (to Division 04). See also Mechanical Docs.
7. Infill and make good existing exterior brick masonry to match existing, and concrete block following removal of exhaust ductwork and exhaust cap (to Division 04). See also Mechanical Docs.
- 8a. Provide weather and thermal barrier connections to complete perimeter of new duct and pipe penetrations for new mechanical equipment this area (to 072000 & 072500). See also Mechanical Docs.
- 8b. Modify existing exterior mass masonry to suit new opening for new exhaust ductwork and exhaust cap. Provide lintels and reinforcing (to Division 04). See also Mechanical Docs.
9. Provide new subfloor to complete room area, following removal and abatement of water and mould damaged substrates and finishes (to 061000). See also Removals and Floor Finishes Plans.
10. Provide new built-up 3-2x12 wood lintel above opening c/w 2 jack and 2 king posts either side of enlarged opening.
11. Provide further subfloor layers and feathering as may be required to ensure max. 1/2" transition from new floor finishes to new prefabricated shower unit (to 061000 & 096500). See also Mech. Docs.
12. Make good enclosure to hydronic system valves and controls (to 062000). See also Mech. Docs.
13. Provide new painted steel handrail c/w stanchion supports (to 057000 & 099000), along full length of existing stair flight. Handrail not shown this plan. Provide handrail in accordance with Detail 5/A701 and complete with all 12" horizontal extensions at tops and bottoms of stair flights.
14. Existing sloped surface up to exterior door to remain. Remove rolled subfloor and strapping as may be required, and replace with new (to 061000).
15. Provide new enclosure to hydronic system valves and controls this location (to 062000). See also Mech. Docs.
16. Provide new subfloor following removal and abatement of water and mould damaged substrates (to 061000). See also Removals and Floor Finishes Plans.

**General Notes to Lockers:**

All Lockers are provided new this Contract, unless specifically noted otherwise.  
See also Section 105100.

**Legend:**

	Building Elevation See A300 series Sheets
	Building Section See A400 series Sheets
	Wall Section / Section Detail See A600 series Sheets
	Foundation Wall Type, Wall Type See A000 series Sheets
	Floor Types, see Sheet A012 Roof Types, see Sheet A215
	Partition Type See A000 series Sheets
	Ceiling Type See Sheet A501
	Room Numbers See Room Finish Schedule(s)
	Opening Numbers See Opening Schedule(s)
	Window Type, see A300 Sheets For Window Schedule(s)
	Millwork Type See A700 series Sheets
	Owner Equipment Numbers See Equipment Schedule(s)
	Denotes Existing Assembly
	Denotes Fire Separation
	Denotes Fire Separation
	Denotes Fire Resistance Rating
	job check indicates dimension which must be confirmed onsite

**General Notes to Floor Plans:**

Comply with Division One and General Requirements of the specifications, and the Conditions of the Contract, which form part of the accomplishment of the Work as if repeated here.

**Perform all work in strict conformance with the Construction Sequence, and to the Construction Schedule milestones.**

Extent of new concrete floor slabs not necessarily shown on Floor Plans. Refer to Removals Plans, and the Mechanical and Electrical Documents, and provide all new concrete slabs on grade to areas of existing slab removals, and where indicated or reasonably inferred, in accordance with Division 03 requirements.

Extent of existing and new steel studs not shown. Refer to Assembly Types, Structural Documents and specifications. All framing members are required and form part of this Contract, regardless of whether shown this Plan or not.

Extent of thermal insulation(s) within assemblies is not shown on floor plans but may be required. Refer to Assembly Types, Details, and specifications for type, depth and extent of insulations. Insulations are required this Contract, in accordance with Sections 070500 & 072000, to form a complete and continuous thermal barrier system.

Extent of acoustic insulation within assemblies is not shown on floor plans but may be required. Refer to Assembly Types and specifications. Acoustic insulation is required this Contract, in accordance with Sections 090500.

Provide all repairs to existing wallboard (to 092000) required following removal of existing elements, including but not limited to at wall bases, existing and new openings, as may be required to ensure continuity of existing fire separations.

For a complete list of required washroom accessories, see Section 102800. For mounting heights and positions of washroom accessories see Sheet A012. All washroom accessories are required to OBC. Provide blocking for all accessories.

For Floor Finishes, see Floor Finishes Plans.

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Equipment shown is for space planning purposes only and for layout of electrical power and devices. All equipment is provided by Owner unless specifically noted otherwise. Notwithstanding, Contractor shall provide blocking in assemblies as necessary to suit wall-mounted equipment, and any other surface mounted equipment supplied by the Owner for installation by this Contract. See also Section 110500.

Provide all cutting and patching required for the mechanical and electrical work of this contract. Co-ordinate requirements and costs with trade contractors. All costs for this work are included in the Contract.

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For layout of plumbing fixtures and washroom accessories in Universal Washrooms and Accessible washroom and shower areas, and abbreviations for washroom accessories throughout, see Sheet A012.

**Project**

**RoW - 84 Frederick St.  
Renovation & Renewal**

84 Frederick St  
Kitchener, ON

BBH	denotes Baseboard Heater, see Mech. & Elec. Docs
CG	denotes Corner Guards (see Finishes Plans)
CR	denotes access control system Card Reader
EHD	denotes Electric Hand Dryer, see also Elec. Docs.
FA	denotes From Above
FB	denotes From Below
FE	denotes Fire Extinguisher
FEC	denotes Fire Extinguisher cabinet c/w extinguisher
FPH	denotes Floor Flow Heater, see Mech. & Elec. Docs
GB	denotes Grab Bar
HSD	denotes Hand Sanitizer Dispenser
NHFB	denotes Non-Freeze Hose Bib
OTA	denotes Open to Above
PB	denotes Push Button
PTD	denotes Paper Towel Dispensers
PTL	denotes Push to Lock
SD	denotes Soap Dispensers
SDU	denotes Sharps Disposal Units
SND	denotes Sanitary Napkin Disposals
TA	denotes To Above
TB	denotes To Below
TPD	denotes Toilet Paper Dispensers

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5	90% Check Set	Dec. 12 '24	MM
T	For Tender	Dec. 19 '24	MM

**General Notes:**

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For Room Finishes Schedules see A910 series Sheets  
For Owner Equipment Schedule see Sheet A921



R1	Rooms & Beds	Oct. 02 '24	MM
No.	Revision	Date	Initial

**Drawing Title**

Approved AD  
Checked MM  
Drawn MM

**Third Floor Plan**

Scale (for 24x36" printing) Dwg. No.  
as noted **A214**

**1 Third Floor Plan**  
**A214** 1/8" = 1'-0"

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No.	Issued for Purpose	Date	Initial
1	Roof Guards	Nov. 18 '24	MM
2	Client Info	Nov. 23 '24	MM
3	30% Check Set	Dec. 05 '24	MM
4	90% Check Set	Dec. 12 '24	MM
T	For Tender	Dec. 19 '24	MM

**General Notes:**

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For Mechanical Drawings see M series Sheets  
 For Electrical Drawings see E series Sheets



No.	Revision	Date	Initial

**Project**  
 RoW - 84 Frederick St.  
 Renovation & Renewal  
 84 Frederick St  
 Kitchener, ON

	Approved	AD
	Checked	MM
	Drawn	AJ

**Roof Plan**

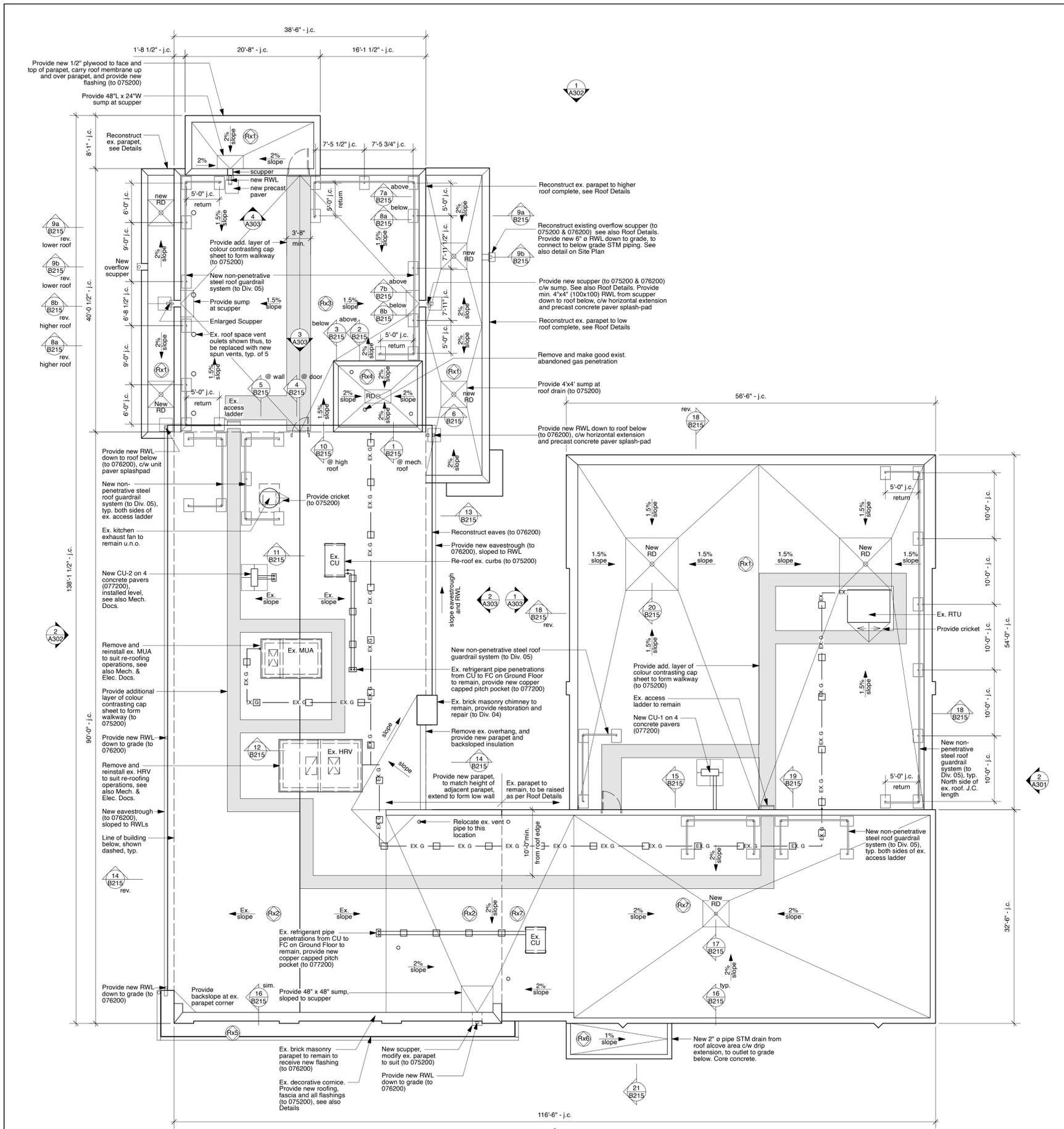
Scale (for 24x36" printing) 1/8" = 1'-0"  
 Dwg. No. A215

John MacDonald Architect inc

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 info@jhmarchitect.com (519) 579 1700

**Roof (r) Types:**

#	Section	Description
Ext. Int.		<p><b>New Mod-Bit Insulated Roofing System:</b></p> <ul style="list-style-type: none"> <li>- New 2 ply mod-bit base &amp; cap sheet, on</li> <li>- New 1/2" high density polyisocyanurate board, on</li> <li>- New sloped polyisocyanurate insulation, on</li> <li>- New 5 1/2" rigid insulation boards, installed in 2 (two) layers, with all joints cross-lapped; on</li> <li>- New sheet a.b.v.r., on</li> <li>- Ex. concrete or steel deck; on</li> <li>- Ex. steel structure</li> </ul> <p>Provide sloped polyisocyanurate insulation to drain to roof drain locations. See Roof Plan for slopes.</p>
Ext. Int.		<p><b>New Mod-Bit Roofing Membrane to Existing Sloped Insulated Roof Truss System:</b></p> <ul style="list-style-type: none"> <li>- New 2 ply mod-bit base &amp; cap sheet (to 075200); on</li> <li>- Ex. 3/4" plywood sheathing, to be made good; on</li> <li>- Ex. wood trussed roof structure</li> <li>- Ex. attic air space, height varies, min. 1"</li> <li>- Ex. 10" mineral wool insulation to remain, between bottom chords of the trusses;</li> <li>- Ex. sheet vapour retarder to remain;</li> <li>- Ex. 2 (two) layers 5/8" type X wallboard, which forms Ex. minimum 1.0 hour f.r.r.</li> </ul> <p>Replace Ex. damaged plywood prior to installation of new membrane (to 06100). For the purposes of Bidding, assume that 25% of the total roof area requires replacement of plywood sheathing.</p> <p>Remove and replace wallboard exposed to view from the interior, and having visible water damage from roof leaks above (to 092000).</p> <p>Firestop all penetrations, whether existing or new, through rated wallboard membrane (to 0784000).</p>
Ext. Int.		<p><b>New Sloped Mod-Bit Roofing System to Existing Flat Roof Area:</b></p> <ul style="list-style-type: none"> <li>- New 2 ply mod-bit base &amp; cap sheet (to 075200); on</li> <li>- New 1/2" high density polyisocyanurate board; on</li> <li>- New sloped polyisocyanurate insulation (to 075200); on</li> <li>- Ex. concrete deck to remain; in</li> <li>- Ex. steel deck, to remain; in</li> <li>- Ex. 10" mineral wool insulation to remain, in between ex. steel framing;</li> <li>- Ex. sheet vapour retarder to remain;</li> <li>- Ex. 2 (two) layers 5/8" type X wallboard, which forms Ex. minimum 1.0 hour f.r.r.</li> </ul> <p>Provide sloped polyisocyanurate insulation to drain to roof drain locations. See Roof Plan for slopes.</p> <p>Remove and replace existing wallboard having visible water damage from leaks, and exposed to view from the interior below (to 092000).</p> <p>Firestop all penetrations, whether existing or new, through rated wallboard membrane (to 0784000).</p>
Ext. Int.		<p><b>New Mod-Bit Roof to Ex. Boiler Room:</b></p> <ul style="list-style-type: none"> <li>- New 2 ply mod-bit base &amp; cap sheet (to 075200); on</li> <li>- New 1/2" high density polyisocyanurate board; on</li> <li>- New sloped polyisocyanurate insulation; on</li> <li>- New 5 1/2" rigid insulation boards, installed in 2 (two) layers, with all joints cross-lapped; on</li> <li>- New sheet a.b.v.r., on</li> <li>- Ex. steel deck, exposed to the interior; on</li> <li>- Ex. steel structure, exposed to the interior.</li> </ul> <p>Provide sloped polyisocyanurate to roof drain. See Roof Plan for slopes.</p>
Ext. Int.		<p><b>New Mod-Bit Roof to Existing Decorative Cornice:</b></p> <ul style="list-style-type: none"> <li>- New 2 ply mod-bit base &amp; cap sheet (to 075200); on</li> <li>- New 1/2" plywood and strapping to form slopes; on</li> <li>- Ex. wood deck, to be made good on</li> <li>- Ex. wood frame structure;</li> <li>- New unfinished steel soffit (to 076200).</li> </ul> <p>Provide new eavestrough to complete perimeter of cornice, sloped to RWL. See Roof Plan.</p>
Ext. Int.		<p><b>New Bituminous Inverted Roofing System to Existing Mechanical Room Alcove:</b></p> <ul style="list-style-type: none"> <li>- New 4" (100mm) washed river rock ballast; on</li> <li>- New geotextile filter fabric, joints lapped; on</li> <li>- New 6" rigid insulation (to 072000), installed in 2 (two) 3" layers, joints lapped and sealed; on</li> <li>- New drainage (dimple) board (to 075200); on</li> <li>- New hot rubberized asphalt roof membrane to form waterproof barrier, air barrier, and vapour retarder systems (to 075200); on</li> <li>- New cementitious thinstret bonding layer to form new slope to top of concrete deck, and to fall to new STM pipe outlet to North side of Alcove;</li> <li>- Ex. 6 1/2" reinforced concrete roof deck; in</li> <li>- Ex. 1 1/2" steel deck; on</li> <li>- Ex. steel structure to remain; on</li> <li>- Ex. concrete foundations to remain.</li> </ul> <p>Extend filter-fabric up perimeter concrete walls to just below top of ballast, and secure.</p>
Ext. Int.		<p><b>New Sloped Mod-Bit Roofing System to Existing Flat Roof Area (Ex. Rated):</b></p> <ul style="list-style-type: none"> <li>- New 2 ply mod-bit base &amp; cap sheet (to 075200); on</li> <li>- New 1/2" high density polyisocyanurate board; on</li> <li>- New sloped polyisocyanurate insulation; on</li> <li>- New 5 1/2" rigid insulation boards, installed in 2 (two) layers, with all joints cross-lapped; on</li> <li>- New sheet a.b.v.r. (to 075200); on</li> <li>- Ex. nominal 2x12 wood joists at 16" oc to remain; on</li> <li>- Ex. 2 (two) layers 5/8" type X wallboard, which forms Ex. minimum 1.0 hour f.r.r.</li> </ul> <p>Provide sloped polyisocyanurate to drain to roof drain locations. See Roof Plan for slopes.</p> <p>Remove and replace existing wallboard having visible water damage from leaks, where exposed to view from the interior below (to 092000).</p> <p>Firestop all penetrations, whether existing or new, through rated wallboard membrane (to 0784000).</p>



1 Roof Plan  
 A215 1/8" = 1'-0"

**Notes to Finishes Plan:**

Obtain consultant acceptance of all seam/joint layouts with submission of seam layout plan shop drawing.

Wall bases are identified for clarification purposes only. Wall base is required to base of all walls/partitions, regardless of whether shown or not.

Not all drain devices are shown. Refer also to Mechanical Documents. Notwithstanding, all drains to be coordinated with the floor finish in which they are found, for type.

BBH denotes Baseboard Heater, see also Mech. Docs.  
 CO denotes Clean Out  
 FA denotes From Above  
 FB denotes From Below  
 FD denotes Floor Drain  
 FFD denotes Funnel Floor Drain  
 RWL denotes Rainwater Leader  
 TA denotes To Above  
 TB denotes To Below

**Notes to Basement Floor Finishes Plan:**

- 1 Provide tactile hazard warning indicators (to 096500). Sides and top of curb along East of existing ramp to receive new paint finishes (to 099000).
- 2 Remove stain finishes from existing ballustrade, guards, and all decorative items and provide new stain finish (to 099000), colour to Consultant's selection. Submit samples.
- 3 wall base not required at base of blockwork

**Legend of Related Finish Abbreviations:**

A.F.F.	- above finished floor
ALUM	- aluminum
CB	- concrete block
CG	- corner guard
CJ	- control joint
CG	- ceiling
CMU	- concrete masonry unit
CO	- clean out
CONC	- concrete
CPT	- carpet
CPTT	- carpet tile
CT	- ceramic tile
EJ	- expansion joint
EXP	- existing
EXP	- exposed structure
EXIST	- existing
F or FL	- floor
FD	- floor drain
FF	- finished floor
FR	- fire resistance rating
FS	- fire separation
GL	- glass
GWB	- gypsum wall board
HW	- hardwood
LAM	- laminate
LAP	- lay-in panel or lay-in acoustic tile
BC	- linoleum base cove
LINO	- linoleum
LSP	- lath and plaster
LVT	- luxury vinyl tile
MLWK	- millwork
MRT	- marble tile
MT	- mosaic tile
N/A	- not applicable
NIC	- not in contract
OWSJ	- open-web steel joist
PCC	- precast concrete
PCT	- porcelain ceramic tile
PLAM	- plastic laminate
PLY	- plywood
PT	- paint
QT	- quarry tile
R	- resilient flooring
RBC	- rubber base cove
RSV	- resilient sheet vinyl
SEAL	- sealed concrete
SV	- sheet vinyl
TER	- terrazzo
TH	- threshold (door)
U/C	- undercut (door)
U/F	- unfinished
VBC	- vinyl base cove
VCT	- vinyl composite tile
VWC	- vinyl wall covering
WG	- wall guard

**Floor Finishes Legend:**

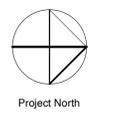
- 07 Floor Finish Type and/or Wall Base Type See also Room Finish Schedule
- Room Numbers See Room Finish Schedule(s)
- Luxury Vinyl Tile Flooring (LVT-1) (to 096500)
- Luxury Vinyl Tile Flooring (LVT-2) (to 096500)
- Sheet Vinyl Flooring (SV-1) (to 096500)
- Sheet Vinyl Flooring (SV-2) (to 096500)
- Existing Tile Flooring to remain
- Existing concrete, sealed (to 033500)
- EPOXY Epoxy paint (to 099000)
- RSL Rubber stair landing tiles (to 096500)
- RSR Rubber stair riser (to 096500)
- RST Rubber stair tread (to 096500)
- SILL Provide new sill. See Detail to Sheet A921.
- Indicates floor slope
- Control Joint (CJ) or Expansion (EJ)
- Seam Joint (not necessarily shown)
- Corner Guard shown thus (to 102600)
- Floor Drain or Clean Out (see also Mechanical Documents)
- j.c. job check indicates dimension which must be confirmed onsite
- hold hold indicates critical dimension which must be held
- +/- plus or minus indicates a dimension which is permitted to vary to suit insitu conditions
- align align indicates critical alignment of materials and/or finishes

For Doors & Frames, see also Openings Schedule(s).  
 For Windows, see also Window Schedule(s).  
 For coordination of floor finishes with Architectural Woodwork (a.k.a. Millwork), see Millwork Drawings

**General Notes:**

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No.	Revision	Date	Initial

**Project**  
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 Renovation & Renewal  
 84 Frederick St  
 Kitchener, ON

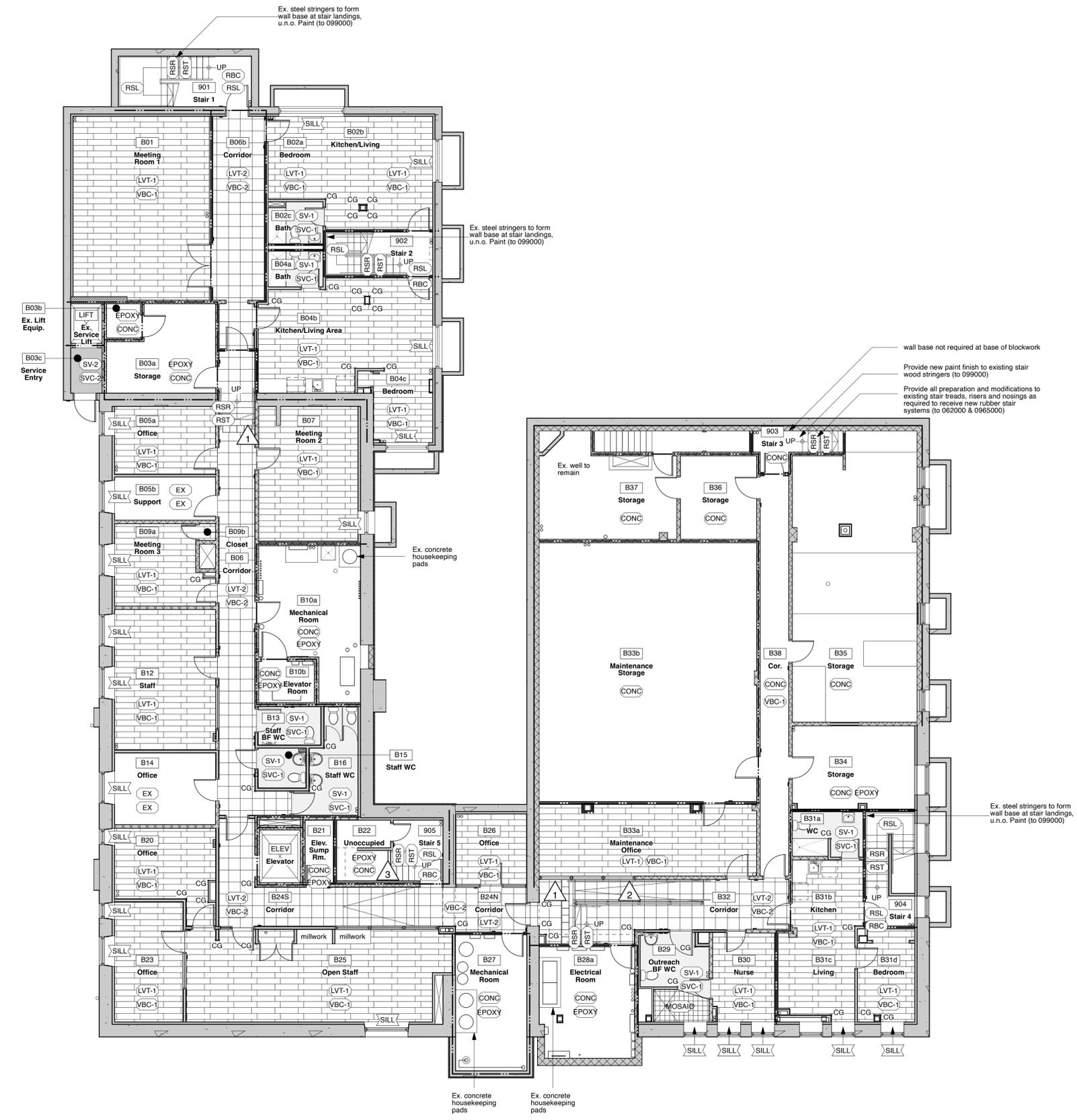
Approved	AD
Checked	MM
Drawing Title	Drawn WA

**Basement Floor Finishes Plan**

Scale (for 24x36" printing) 1/8" = 1'-0"  
 Dwg. No. A231

**John MacDonald Architect inc**

195 King Street West, Suite 202 Kitchener, ON N2G 1B1  
 info@johmacdonaldarchitect.ca (519) 579 1700



**1**  
**A231** Basement Floor Finishes Plan  
 1/8" = 1'-0"

**Notes to Finishes Plan:**

Obtain consultant acceptance of all seam/joint layouts with submission of seam layout plan shop drawing.

Wall bases are identified for clarification purposes only. Wall base is required to base of all walls/partitions, regardless of whether shown or not.

Not all drain devices are shown. Refer also to Mechanical Documents. Notwithstanding, all drains to be coordinated with the floor finish in which they are found, for type.

BBH denotes Baseboard Heater, see also Mech. Docs.  
 CO denotes Clean Out  
 FA denotes From Above  
 FB denotes From Below  
 FD denotes Floor Drain  
 FFD denotes Funnel Floor Drain  
 RWL denotes Rainwater Leader  
 TA denotes To Above  
 TB denotes To Below

**Notes to Ground Floor Finishes Plan:**

- 1 Remove stain finishes from existing balustrade, guards, and all decorative items and provide new stain finish (to 099000), colour to Consultant's selection.
- 2 Existing decorative wood base trim to remain. Remove stain finishes and provide new stain finish (to 099000), colour to Consultant's selection.
- 3 Provide new vinyl base cove to millwork kick (to 096500), following repair of kick (to 064000).
- 4 Existing ceramic wall tile finishes to walls this area to remain. replace damaged or cracked tiles with new to match existing. Clean all grout.
- 5 Provide tactile hazard warning indicators (to 096500).

**Legend of Related Finish Abbreviations:**

A.F.F.	- above finished floor
ALUM	- aluminum
CB	- concrete block
CG	- corner guard
CJ	- control joint
CG	- ceiling
CMU	- concrete masonry unit
CO	- clean out
CONC	- concrete
CPT	- carpet
CPTT	- carpet tile
CT	- ceramic tile
EJ	- expansion joint
EX	- existing
EXP	- exposed structure
EXIST	- existing
F or FL	- floor
FD	- floor drain
FF	- finished floor
FRR	- fire resistance rating
FS	- fire separation
GL	- glass
GWB	- gypsum wall board
HWD	- hardwood
LAM	- laminate
LAP	- lay-in panel or lay-in acoustic tile
BC	- linoleum base cove
LINO	- linoleum
LSP	- lath and plaster
LVT	- luxury vinyl tile
MLWK	- millwork
MRT	- marble tile
MT	- mosaic tile
N/A	- not applicable
NIC	- not in contract
OWSJ	- open-web steel joist
PCC	- precast concrete
PCT	- porcelain ceramic tile
PLAM	- plastic laminate
PLY	- plywood
PT	- paint
QT	- quarry tile
R	- resilient flooring
RBC	- rubber base cove
RSV	- resilient sheet vinyl
SEAL	- sealed concrete
SV	- sheet vinyl
TER	- terrazzo
TH	- threshold (door)
UIC	- undercut (door)
U/F	- unfinished
VBC	- vinyl base cove
VCT	- vinyl composite tile
VVC	- vinyl wall covering
WG	- wall guard

**Floor Finishes Legend:**

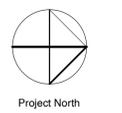
- Floor Finish Type and/or Wall Base Type See also Room Finish Schedule
- 07 Room Numbers See Room Finish Schedule(s)
- ▨ Luxury Vinyl Tile Flooring (LVT-1) (to 096500)
- ▨ Luxury Vinyl Tile Flooring (LVT-2) (to 096500)
- ▨ Sheet Vinyl Flooring (SV-1) (to 096500)
- ▨ Sheet Vinyl Flooring (SV-2) (to 096500)
- ▨ Existing Tile Flooring to remain
- CONC Existing concrete, sealed (to 033500)
- EPOXY Epoxy paint (to 099000)
- RSL Rubber stair landing tiles (to 096500)
- RSR Rubber stair riser (to 096500)
- RST Rubber stair tread (to 096500)
- SILL Provide new sill. See Detail to Sheet A711.
- Indicates floor slope
- Control Joint (CJ) or Expansion (EJ)
- - - Seam Joint (not necessarily shown)
- ┌ Corner Guard shown thus (to 102600)
- Floor Drain or Clean Out (see also Mechanical Documents)
- j.c. job check indicates dimension which must be confirmed onsite
- hold hold indicates critical dimension which must be held
- +/- plus or minus indicates a dimension which is permitted to vary to suit insitu conditions
- align align indicates critical alignment of materials and/or finishes

For Doors & Frames, see also Openings Schedule(s).  
 For Windows, see also Window Schedule(s).  
 For coordination of floor finishes with Architectural Woodwork (a.k.a. Millwork), see Millwork Drawings

**General Notes:**

For Cover and General Notes see Sheet A001  
 For OBC Matrix and Information see Sheet A011  
 For WC Accessories OBC Requirements see Sheet A012  
 For Assembly Types see Sheet A021  
 For Sequence of Construction see Sheet A031  
 For Site Plan see Sheet A121  
 For Floor Plan Removals see A200 series Sheets  
 For Floor Plans see A210 series Sheets  
 For Roof Plan see Sheet A215  
 For Roof Assembly Types see Sheet A215  
 For Floor Finishes Plans see A230 series Sheets  
 For Building Elevations see A300 series Sheets  
 For Window Schedules see Sheet A311  
 For Window Coverings Schedule see Sheet A321  
 For Reflected Ceiling Plans see A500 series Sheets  
 For Ceiling Assembly Types see Sheet A501  
 For Wall Sections see A600 series Sheets  
 For Stair Plans, & Sections see A700 series Sheets  
 For Millwork see A710 series Sheets  
 For Openings Schedules see A800 series Sheets  
 For Room Finishes Schedules see A910 series Sheets  
 For Owner Equipment Schedule see Sheet A921

For Mechanical Drawings see M series Sheets  
 For Electrical Drawings see E series Sheets



No.	Revision	Date	Initial

**Project**  
 RoW - 84 Frederick St.  
 Renovation & Renewal  
 84 Frederick St  
 Kitchener, ON

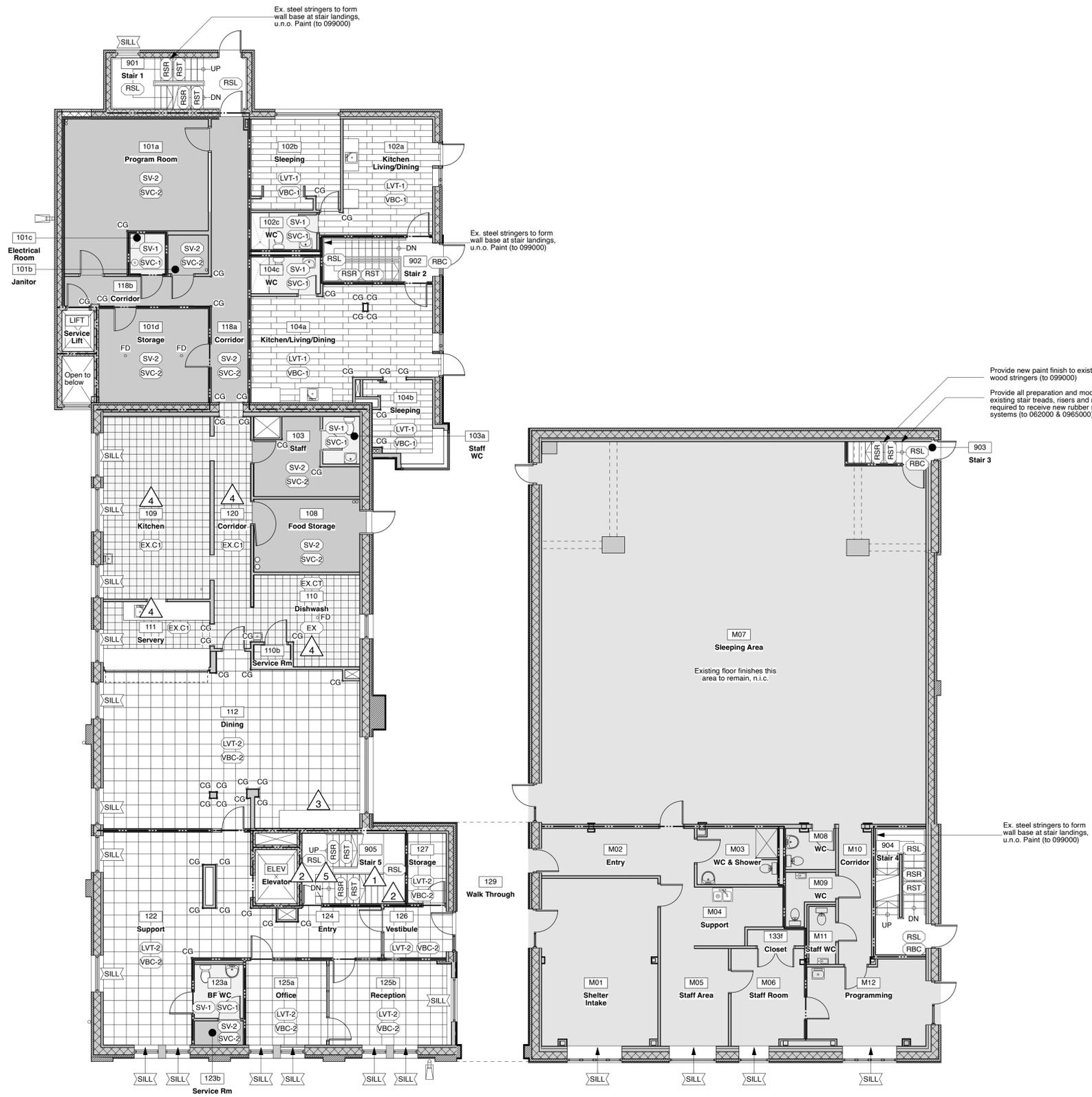
Approved	AD
Checked	MM
Drawing Title	Drawn VA

**Ground Floor Finishes Plan**

Scale (for 24x36" printing) 1/8" = 1'-0"  
 Dwg. No. A232

**John MacDonald Architect inc**

195 King Street West, Suite 202 Kitchener, ON N2G 1B1  
 info@johmacdonaldarchitect.ca (519) 579 1700



1 Ground Floor Finishes Plan  
 A232 1/8" = 1'-0"

### Notes to Finishes Plan:

Obtain consultant acceptance of all seam/joint layouts with submission of seam layout plan shop drawing.

Wall bases are identified for clarification purposes only. Wall base is required to base of all walls/partitions, regardless of whether shown or not.

Not all drain devices are shown. Refer also to Mechanical Documents. Notwithstanding, all drains to be coordinated with the floor finish in which they are found, for type.

- BBH denotes Baseboard Heater, see also Mech. Docs.
- CO denotes Clean Out
- FA denotes From Above
- FB denotes From Below
- FD denotes Floor Drain
- FFD denotes Funnel Floor Drain
- RWL denotes Rainwater Leader
- TA denotes To Above
- TB denotes To Below

### Notes to Second Floor Finishes Plan:

1 Remove stain finishes from existing balustrade, guards, and all decorative items and provide new stain finish (to 099000), colour to Consultant's selection.

2 Existing decorative wood base trim to remain. Remove stain finishes and provide new stain finish (to 099000), colour to Consultant's selection.

3 Sill to Laundry room shall extend out to form top of furring below, and shall extend for full width of the room (to 064000).

4 Provide tactile hazard warning indicators (to 096500).

### Legend of Related Finish Abbreviations:

- A.F.F. - above finished floor
- ALUM - aluminum
- MRT - marble tile
- CG - corner guard
- CJ - control joint
- NLG - ceiling
- CMU - concrete masonry unit
- CO - clean out
- CONC - concrete
- CPT - carpet
- CPTT - carpet tile
- CT - ceramic tile
- EJ - expansion joint
- EX - existing
- EXP - exposed structure
- EXIST - existing
- F or FL - floor
- FD - floor drain
- FF - finished floor
- FR - fire resistance rating
- FS - fire separation
- GL - glass
- GWB - gypsum wall board
- HWD - hardwood
- LAM - laminate
- LAP - lay-in panel or lay-in acoustic tile
- LC - linoleum base cove
- LINO - linoleum
- LSP - lath and plaster
- LVT - luxury vinyl tile
- MLWK - millwork
- MRT - marble tile
- MT - mosaic tile
- N/A - not applicable
- NIC - not in contract
- OWSJ - open-web steel joist
- PCC - precast concrete
- PCT - porcelain ceramic tile
- PLAM - plastic laminate
- PLY - plywood
- PT - paint
- QT - quarry tile
- R - resilient flooring
- RBC - rubber base cove
- RSV - resilient sheet vinyl
- SEAL - sealed concrete
- SV - sheet vinyl
- TER - terrazzo
- TH - threshold (door)
- U/C - undercut (floor)
- U/F - unfinished
- VBC - vinyl base cove
- VCT - vinyl composite tile
- VWC - vinyl wall covering
- WG - wall guard

No.	Issued for Purpose	Date	Initial
1	30% Check Set	Dec 05 '24	MM
2	90% Check Set	Dec 12 '24	MM
T	For Tender	Dec 19 '24	MM

### General Notes:

- For Cover and General Notes see Sheet A001
- For OBC Matrix and Information see Sheet A011
- For WC Accessories OBC Requirements see Sheet A012
- For Assembly Types see Sheet A021
- For Sequence of Construction see Sheet A031
- For Site Plan see Sheet A121
- For Floor Plan Removals see A200 series Sheets
- For Floor Plans see A210 series Sheets
- For Roof Plan see Sheet A215
- For Roof Assembly Types see Sheet A215
- For Floor Finishes Plans see A230 series Sheets
- For Building Elevations see A300 series Sheets
- For Window Schedules see Sheet A311
- For Window Coverings Schedule see Sheet A321
- For Reflected Ceiling Plans see A500 series Sheets
- For Ceiling Assembly Types see Sheet A501
- For Wall Sections see A600 series Sheets
- For Stair Plans, & Sections see A700 series Sheets
- For Millwork see A710 series Sheets
- For Openings Schedules see A800 series Sheets
- For Room Finishes Schedules see A910 series Sheets
- For Owner Equipment Schedule see Sheet A921
- For Mechanical Drawings see M series Sheets
- For Electrical Drawings see E series Sheets



### Floor Finishes Legend:

- Floor Finish Type and/or Wall Base Type
- 07 Room Numbers
- See Room Finish Schedule(s)
- Luxury Vinyl Tile Flooring (LVT-1) (to 096500)
- Luxury Vinyl Tile Flooring (LVT-2) (to 096500)
- Sheet Vinyl Flooring (SV-1) (to 096500)
- Sheet Vinyl Flooring (SV-2) (to 096500)
- Existing Tile Flooring to remain
- CONC Existing concrete, sealed (to 033500)
- EPOXY Epoxy paint (to 099000)
- RSL Rubber stair landing tiles (to 096500)
- RSR Rubber stair riser (to 096500)
- RST Rubber stair tread (to 096500)
- SILL Provide new sill. See Detail to Sheet A911.
- Indicates floor slope
- Control Joint (CJ) or Expansion (EJ)
- - - Seam Joint (not necessarily shown)
- ┌ Corner Guard shown thus (to 102600)
- Floor Drain or Clean Out (see also Mechanical Documents)
- j.c. job check indicates dimension which must be confirmed onsite
- hold hold indicates critical dimension which must be held
- +/- plus or minus indicates a dimension which is permitted to vary to suit insitu conditions
- align align indicates critical alignment of materials and/or finishes

For Doors & Frames, see also Openings Schedule(s).  
For Windows, see also Window Schedule(s).  
For coordination of floor finishes with Architectural Woodwork (a.k.a. Millwork), see Millwork Drawings

No.	Revision	Date	Initial

**Project**  
RoW - 84 Frederick St.  
Renovation & Renewal  
84 Frederick St  
Kitchener, ON

Approved	AD
Checked	MM
Drawing Title	Drawn WA

**Second Floor Finishes Plan**

Scale (for 24x36" printing) 1/8" = 1'-0"  
Dwg. No. A233

**John MacDonald Architect inc**

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info@johmacdonaldarchitect.ca (519) 579 1700



1 Second Floor Finishes Plan  
A233 1/8" = 1'-0"

### Notes to Finishes Plan:

Obtain consultant acceptance of all seam/joint layouts with submission of seam layout plan shop drawing.

Wall bases are identified for clarification purposes only. Wall base is required to base of all walls/partitions, regardless of whether shown or not.

Not all drain devices are shown. Refer also to Mechanical Documents. Notwithstanding, all drains to be coordinated with the floor finish in which they are found, for type.

- BBH denotes Baseboard Heater, see also Mech. Docs.
- CO denotes Clean Out
- FA denotes From Above
- FB denotes From Below
- FD denotes Floor Drain
- FFD denotes Funnel Floor Drain
- RWL denotes Rainwater Leader
- TA denotes To Above
- TB denotes To Below

### Notes to Third Floor Finishes Plan:

- 1 Provide tactile hazard warning indicators (to 096500).
- 2 Remove stain finishes from existing balustrade, guards, and all decorative items and provide new stain finish (to 099000), colour to Consultant's selection.
- 3 Existing decorative wood base trim to remain. Remove stain finishes and provide new stain finish (to 099000), colour to Consultant's selection.
- 4 Sill to Laundry room shall extend out to form top of luring below, and shall extend for full width of the room (to 064000).
- 5 Existing sloped floor up to exit door. Remove and replace all damaged and/or rotted sub-floor and strapping and replace with new (to 061000). Provide resilient flooring (to 096500), for seamless transition from floor to ramp. Provide reinforced stainless steel trim to sides or sloped surface adjacent sleeping room door.
- 6 New wood steps to roof. Provide new floor finish (to 0965000). See also Part Plan Detail on Third Floor Plan.

### Legend of Related Finish Abbreviations:

- A.F.F. - above finished floor
- ALUM - aluminum
- CB - concrete block
- CG - corner guard
- CJ - control joint
- CLG - ceiling
- CMU - concrete masonry unit
- CO - clean out
- CONC - concrete
- CPT - carpet
- CPTT - carpet tile
- CT - ceramic tile
- EJ - expansion joint
- EX - existing
- EXP - exposed structure
- EXIST - existing
- F or FL - floor
- FD - floor drain
- FF - finished floor
- FRR - fire resistance rating
- FS - fire separation
- GL - glass
- GWB - gypsum wall board
- HWD - hardwood
- LAM - laminate
- LAP - lay-in panel or lay-in acoustic tile
- LBC - linoleum base cove
- LINO - linoleum
- LSP - lath and plaster
- LVT - luxury vinyl tile
- MLWK - millwork
- MRT - marble tile
- MT - mosaic tile
- N/A - not applicable
- NIC - not in contract
- OWSJ - open-web steel joist
- PCC - precast concrete
- PCT - porcelain ceramic tile
- PLAM - plastic laminate
- PLY - plywood
- PT - paint
- QT - quarry tile
- R - resilient flooring
- RBC - rubber base cove
- RSV - resilient sheet vinyl
- SEAL - sealed concrete
- SV - sheet vinyl
- TER - terrazzo
- TH - threshold (door)
- UIC - undercut (door)
- U/F - unfinished
- VBC - vinyl base cove
- VCT - vinyl composite tile
- VWC - vinyl wall covering
- WG - wall guard

### General Notes:

For Cover and General Notes see Sheet A001  
 For OBC Matrix and Information see Sheet A011  
 For WC Accessories OBC Requirements see Sheet A012  
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 For Stair Plans, & Sections see A700 series Sheets  
 For Millwork see A710 series Sheets  
 For Openings Schedules see A800 series Sheets  
 For Room Finishes Schedules see A910 series Sheets  
 For Owner Equipment Schedule see Sheet A921  
 For Mechanical Drawings see M series Sheets  
 For Electrical Drawings see E series Sheets



No.	Revision	Date	Initial
1	30% Check Set	Dec. 05 '24	MM
2	90% Check Set	Dec. 12 '24	MM
	For Tender	Dec. 19 '24	MM

### Project

RoW - 84 Frederick St.  
 Renovation & Renewal  
 84 Frederick St  
 Kitchener, ON

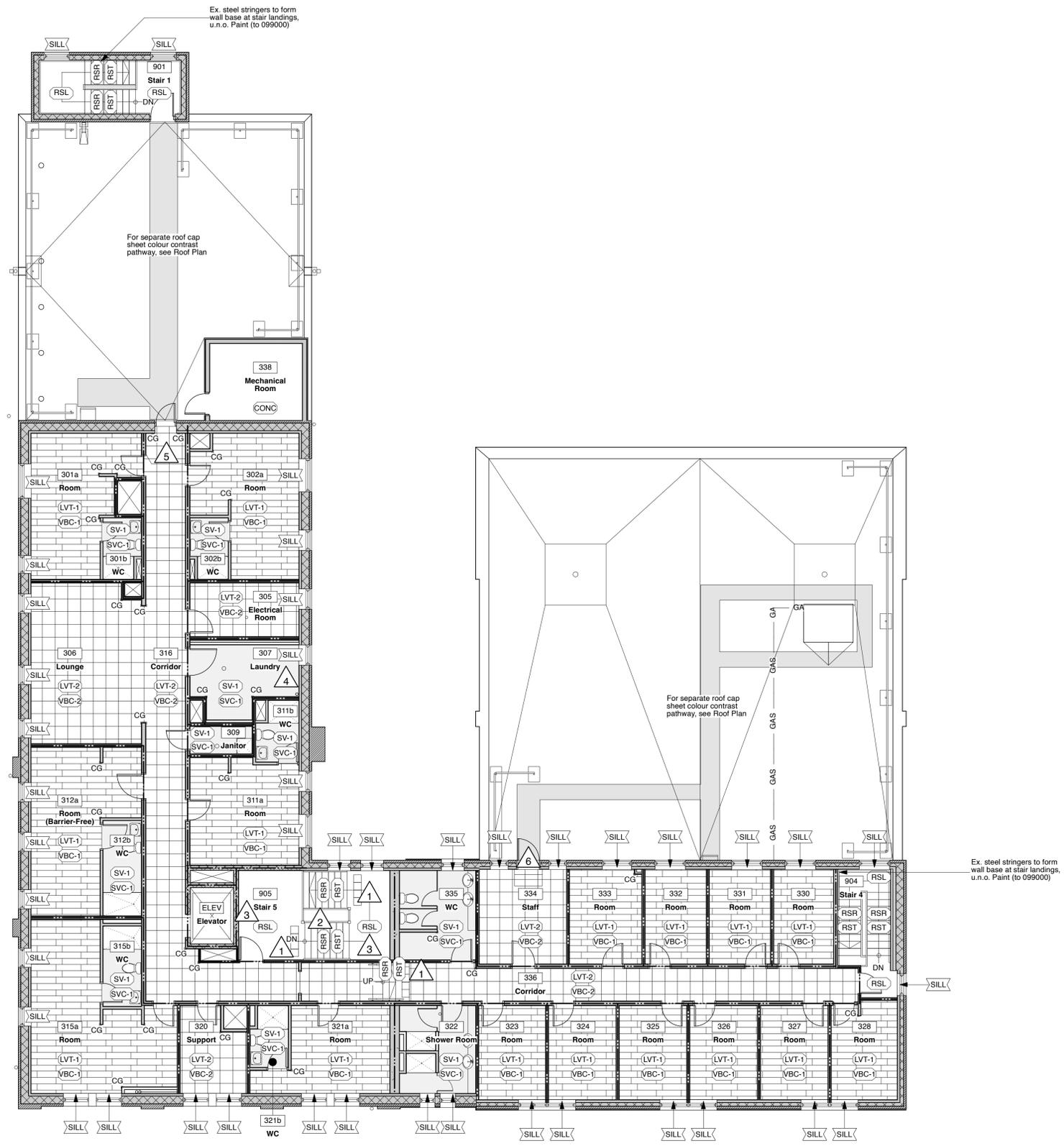
Drawing Title	Approved	AD
	Checked	MM
	Drawn	VA

### Third Floor Finishes Plan

Scale	Dwg. No.
1/8" = 1'-0"	A234

John MacDonald Architect inc

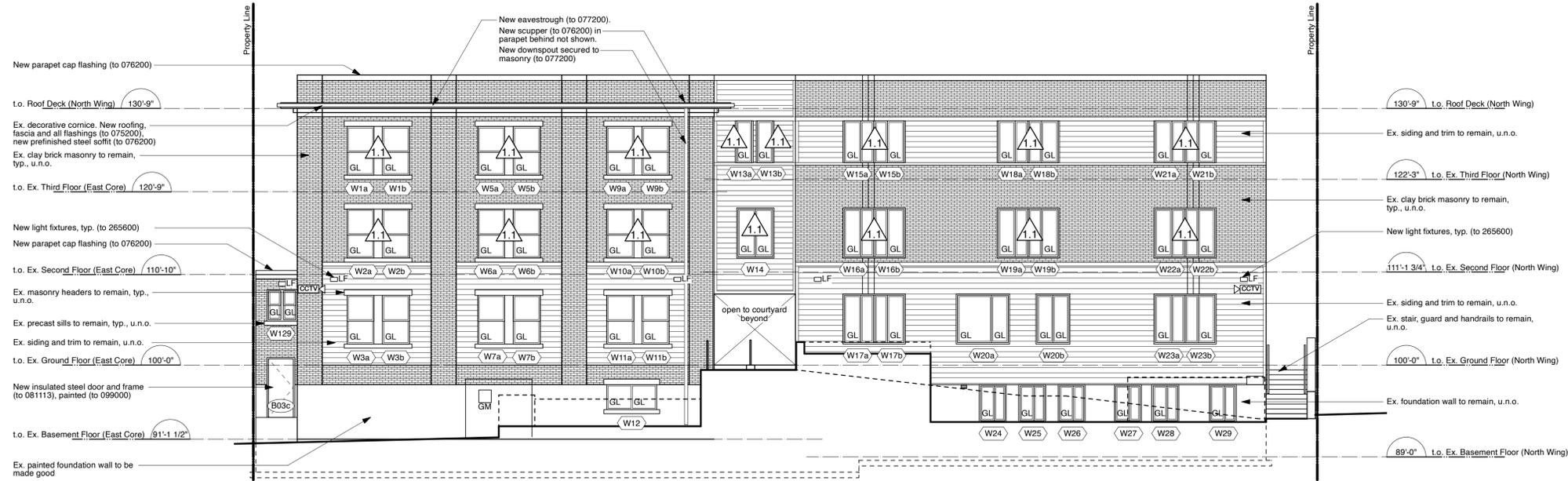
195 King Street West, Suite 202 Kitchener, ON N2G 1B1  
 info@johmacdonaldarchitect.ca (519) 579 1700



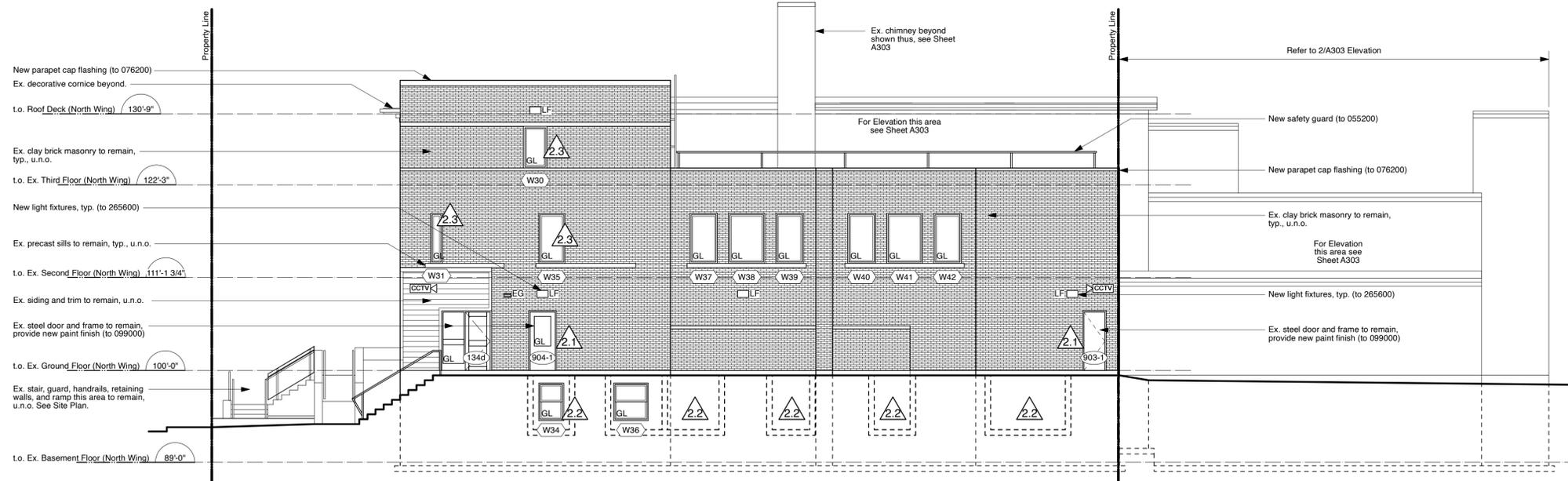
1 Third Floor Finishes Plan  
 A234 1/8" = 1'-0"

**Notes to East Elevation:**

△ 1.1 Provide new window (by Cash Allowance).



**1 East Elevation**  
A301 1/8" = 1'-0"



**2 North Elevation**  
A301 1/8" = 1'-0"

**Notes to North Elevation:**

- △ 1.1 Provide new sealant (to 079000) to complete perimeter of door openings.
- △ 2.2 Clean all debris from window wells, typ. Provide new sealant to perimeter of all penetrations and openings.
- △ 2.3 Provide new window (by Cash Allowance).

**Legend:**

- 1/A301 Building Elevation See A300 series Sheets
- 1/A401 Building Section See A400 series Sheets
- 1/A601 Wall Section See A600 series Sheets
- WF Foundation Wall Type, Wall Type See A000 series Sheets
- FB Floor Types, see A000 series Sheets Roof Types, see Sheet A215
- PF Partition Type See A000 series Sheets
- CF Ceiling Type See Sheet A501
- 07 Room Numbers See Room Finish Schedule(s)
- 10 Opening Numbers See Opening Schedule(s)
- Wxx Window Type, see A300 Sheets for Window Schedule(s)
- Mxx Millwork Type See A710 series Sheets
- 1.1 Owner Equipment Numbers See Equipment Schedule(s)
- Denotes Existing Assembly
- Denotes Fire Separation
- F.S. Denotes Fire Separation
- F.R.R. Denotes Fire Resistance Rating
- j.c. job check indicates dimension which must be confirmed onsite

**General Notes to Building Elevations:**

Not all cladding materials are necessarily shown.  
 Coordinate with Electrical Documents for all power requirements to exterior luminaires. Where discrepancy exists between the building elevations and the electrical documents, the most stringent condition shall govern.  
 Obtain clarification from Consultant for mounting heights of all devices mounted to exterior assemblies.  
 All dimensions to windows are rough openings.  
 Line of grade is shown diagrammatic. Review existing conditions  
 AI denotes Air Intake  
 CCTV denotes Security Camera Equipment location.  
 EG denotes Exhaust Grille or Ventilation Outlet  
 GL denotes Glazing  
 GM denotes Gas Meter, by local utility  
 LF denotes Light Fixture or Luminaire (see also Electrical Documents)  
 LV denotes Louver (to 233000), see also Mechanical Documents for sizes.  
 PB denotes Barricade-Free Push Button  
 NFHB denotes Non-Freeze Hose Bib, see also mech. docs.  
 denotes Brick Re-pointing

**General Notes to Masonry Re-Pointing & Deep Pointing:**

Refer also to Division 04 of the Specifications.  
 Historic Masonry Trade Contractor shall survey all existing brick masonry and shall prepare and submit written conditions reporting to Owner and Consultant. Provide all equipment and temporary measures as may be required to perform survey. Reporting shall identify all areas by level of degradation, and shall include recommendations for masonry including but not limited to categories of:  
 - high degradation requiring immediate action;  
 - some degradation, repairs highly recommended;  
 - minor degradation, repair within 5-10 years; and  
 - good condition, no action required at this time.  
 Carry in the Contract Work to:  
 - replace 500 bricks  
 - re-point 4,000 lin. ft. of mortar  
 - deep mortar re-point 1,000 lin. ft.  
 - temporary measures  
 Owner will select areas for re-pointing based on reporting.  
 Notwithstanding, areas of masonry re-pointing and deep pointing indicated on the building elevations represent areas requiring immediate repairs this Contract. Provide all re-pointing and deep pointing to such areas. Such areas are included in the above allowance for linear feet of pointing work.

**General Notes to Exterior Light Fixtures/Luminaires (LF):**

Refer also to Electrical Documents.  
 All existing exterior luminaires are to be replaced with new. See also Electrical Lighting Plans and Luminaire Schedules. Provide all modifications to feeds and mountings as may be required, to suit new luminaire selections.

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 This document is to be read together with all other documents issued for the specific purpose noted, and all other documents further referenced therein.

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 The reader shall immediately notify the Architect of all inconsistencies, errors, or omissions which they may discover in this or other documents, or in their relation in whole or in part.

No.	Issued for Purpose	Date	Initial
1	Window tag reference	Nov 15 '24	MM
2	30% Check Set	Dec. 05 '24	MM
3	90% Check Set	Dec. 12 '24	MM
T	For Tender	Dec. 19 '24	MM

**General Notes:**

For Cover and General Notes see Sheet A001  
 For OBC Matrix and Information see Sheet A011  
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 For Millwork see A710 series Sheets  
 For Openings Schedules see A900 series Sheets  
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No.	Revision	Date	Initial

**Project**  
 RoW - 84 Frederick St.  
 Renovation & Renewal  
 84 Frederick St  
 Kitchener, ON

Approved	AD
Checked	MM
Drawing Title	Drawn AJ

**Building Elevations**

Scale (for 24x36" printing) 1/8" = 1'-0"  
 Dwg. No. A301

**John MacDonald Architect inc**

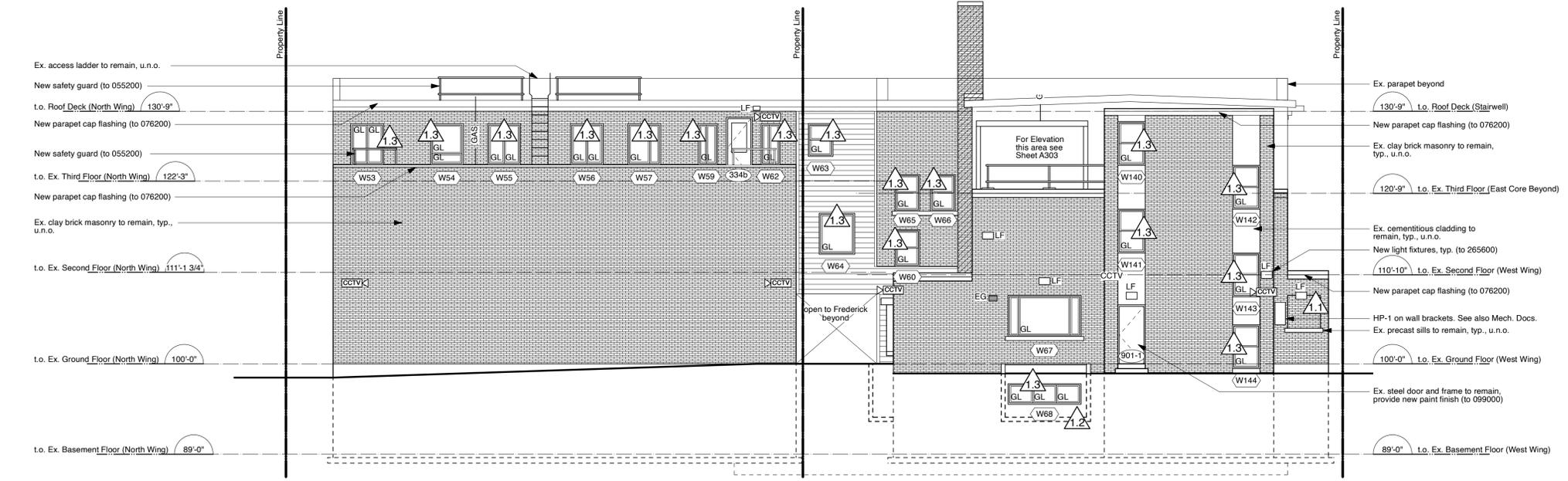
195 King Street West, Suite 202 Kitchener, ON N2G 1B1  
 info@johmacdonaldarchitect.ca (519) 579 1700

**Notes to West Elevation:**

- 1.1 Remove existing infill partition, and dispose. Infill and make good with masonry clay brick to match existing (to Div. 4). See also Floor Plan.
- 1.2 Clean all debris from window wells, typ. Provide new sealant to perimeter of all penetrations and openings.
- 1.3 Provide new window (by Cash Allowance).

**Legend:**

- 1 A301 Building Elevation See A300 series Sheets
- 1 A401 Building Section See A400 series Sheets
- 1 A601 Wall Section See A600 series Sheets
- WF# Foundation Wall Type, Wall Type See A000 series Sheets
- FB# Floor Types, see A000 series Sheets Roof Types, see Sheet A215
- PF# Partition Type See A000 series Sheets
- CF# Ceiling Type See Sheet A501
- 07 Room Numbers See Room Finish Schedule(s)
- 10 Opening Numbers See Opening Schedule(s)
- Wxx Window Type, see A300 Sheets for Window Schedule(s)
- Mxx Millwork Type See A710 series Sheets
- 1.1 Owner Equipment Numbers See Equipment Schedule(s)
- Denotes Existing Assembly
- Denotes Fire Separation
- F.S. Denotes Fire Separation
- F.R.R. Denotes Fire Resistance Rating
- j.c. job check indicates dimension which must be confirmed onsite



1 West Elevation  
A302 1/8" = 1'-0"

**General Notes to Building Elevations:**

- Not all cladding materials are necessarily shown.
- Coordinate with Electrical Documents for all power requirements to exterior luminaires. Where discrepancy exists between the building elevations and the electrical documents, the most stringent condition shall govern.
- Obtain clarification from Consultant for mounting heights of all devices mounted to exterior assemblies.
- All dimensions to windows are rough openings.
- Line of grade is shown diagrammatic. Review existing conditions
- AI denotes Air Intake
- CCTV denotes Security Camera Equipment location.
- EG denotes Exhaust Grille or Ventilation Outlet
- GL denotes Glazing
- GM denotes Gas Meter, by local utility
- LF denotes Light Fixture or Luminaire (see also Electrical Documents)
- LV denotes Louver (to 233000), see also Mechanical Documents for sizes.
- PB denotes Barrier-Free Push Button
- NFHB denotes Non-Freeze Hose Bib, see also mech. docs.
- denotes Brick Repointing

**General Notes to Masonry Re-Pointing & Deep Pointing:**

- Refer also to Division 04 of the Specifications.
- Historic Masonry Trade Contractor shall survey all existing brick masonry and shall prepare and submit written conditions reporting to Owner and Consultant. Provide all equipment and temporary measures as may be required to perform survey. Reporting shall identify all areas by level of degradation, and shall include recommendations for masonry including but not limited to categories of:
  - high degradation requiring immediate action;
  - some degradation, repairs highly recommended;
  - minor degradation, repair within 5-10 years; and
  - good condition, no action required at this time.
- Carry in the Contract Work to:
  - replace 500 bricks
  - re-point 4,000 lin. ft. of mortar
  - deep mortar re-point 1,000 lin. ft.
  - temporary measures
- Owner will select areas for re-pointing based on reporting.
- Notwithstanding, areas of masonry re-pointing and deep pointing indicated on the building elevations represent areas requiring immediate repairs this Contract. Provide all re-pointing and deep pointing to such areas. Such areas are included in the above allowance for linear feet of pointing work.

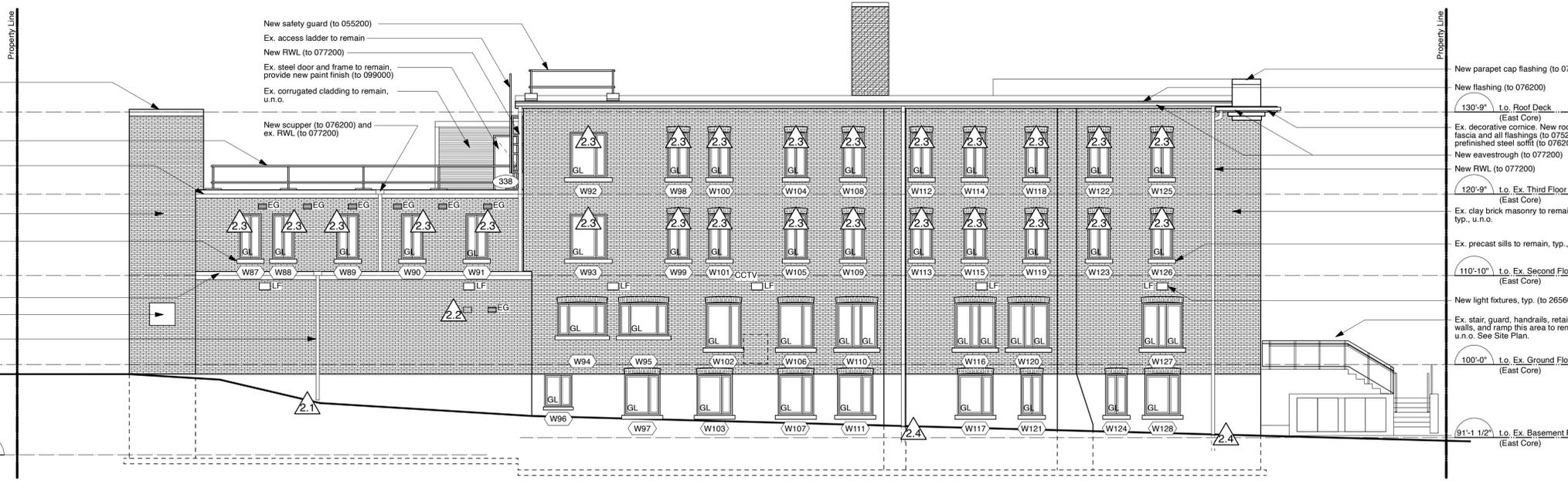
**General Notes to Exterior Light Fixtures/Luminaires (LF):**

- Refer also to Electrical Documents.
- All existing exterior luminaires are to be replaced with new. See also Electrical Lighting Plans and Luminaire Schedules. Provide all modifications to feeds and mountings as may be required, to suit new luminaire selections.

**Notes to South Elevation:**

- 2.1 Provide horizontal extension to RWL c/w and precast concrete paver splash-pad (to 077200).
- 2.2 Remove existing dryer vent hood. Infill and make good with masonry clay brick to match existing (to Div. 4).
- 2.3 Provide new window (by Cash Allowance).
- 2.4 Provide new RWL FATB grade to connect to existing site STM system. See also Detail 2/A121.

2 South Elevation  
A302 1/8" = 1'-0"



No.	Issued for Purpose	Date	Initial
1	Window tag reference	Nov 15 '24	MM
2	30% Check Set	Dec 05 '24	MM
3	90% Check Set	Dec 12 '24	MM
T	For Tender	Dec 19 '24	MM

**General Notes:**

- For Cover and General Notes see Sheet A001
- For OBC Matrix and Information see Sheet A011
- For WC Accessories OBC Requirements see Sheet A012
- For Assembly Types see Sheet A021
- For Sequence of Construction see Sheet A031
- For Site Plan see Sheet A121
- For Floor Plan Removals see A200 series Sheets
- For Floor Plans see A210 series Sheets
- For Roof Plan see Sheet A215
- For Roof Assembly Types see Sheet A215
- For Floor Finishes Plans see A230 series Sheets
- For Building Elevations see A300 series Sheets
- For Window Schedules see Sheet A311
- For Window Coverings Schedule see Sheet A321
- For Reflected Ceiling Plans see A500 series Sheets
- For Ceiling Assembly Types see Sheet A501
- For Wall Sections see A600 series Sheets
- For Stair Plans, & Sections see A700 series Sheets
- For Millwork see A710 series Sheets
- For Openings Schedules see A900 series Sheets
- For Room Finishes Schedules see A910 series Sheets
- For Owner Equipment Schedule see Sheet A921
- For Mechanical Drawings see M series Sheets
- For Electrical Drawings see E series Sheets

No.	Revision	Date	Initial

**Project**  
RoW - 84 Frederick St.  
Renovation & Renewal  
84 Frederick St  
Kitchener, ON

Approved	AD
Checked	MM
Drawing Title	Drawn AJ

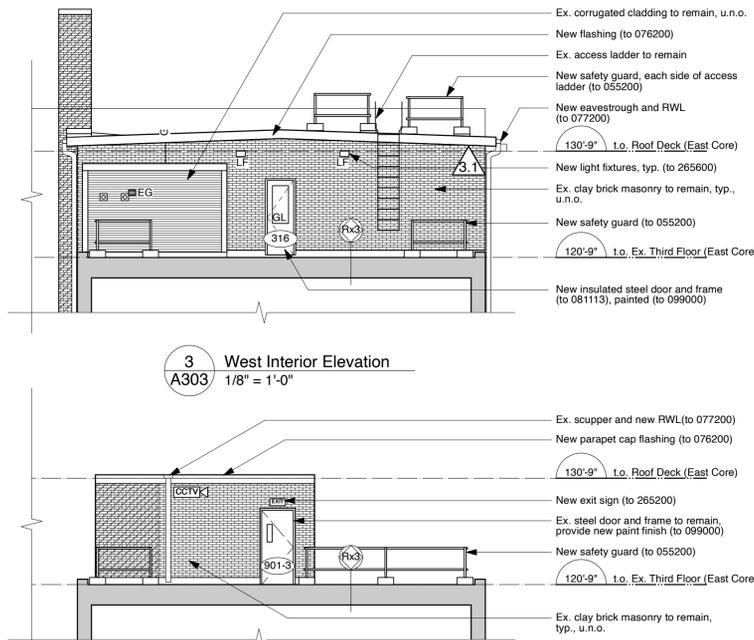
**Building Elevations**

Scale (for 24x36" printing) Dwg. No.  
1/8" = 1'-0" A302

**John MacDonald Architect inc**

**Notes to West Interior Elevation:**

3.1 Repair and/or replace soffit this location.

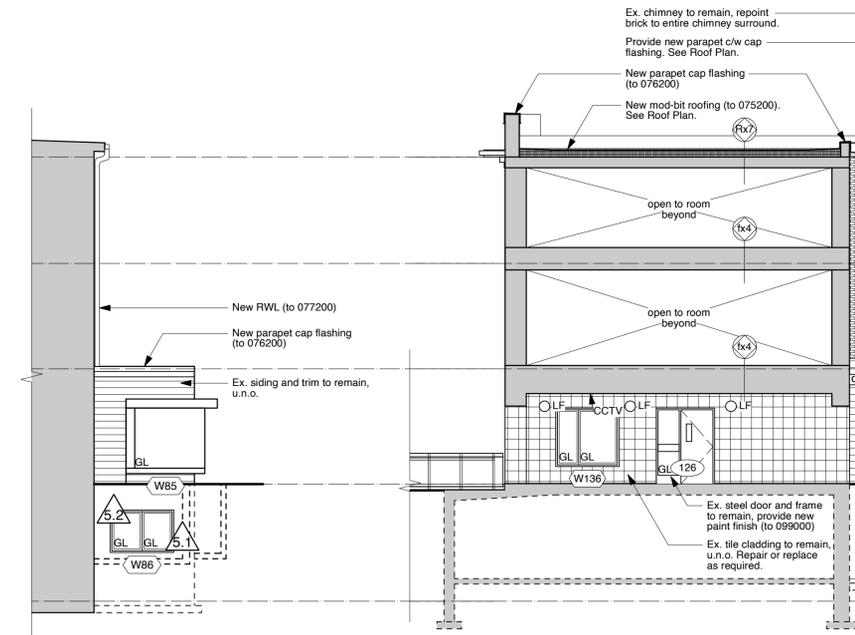


**3 West Interior Elevation**  
1/8" = 1'-0"

**4 East Interior Elevation**  
1/8" = 1'-0"

**Notes to East Interior Elevation:**

4.1 Reserved.



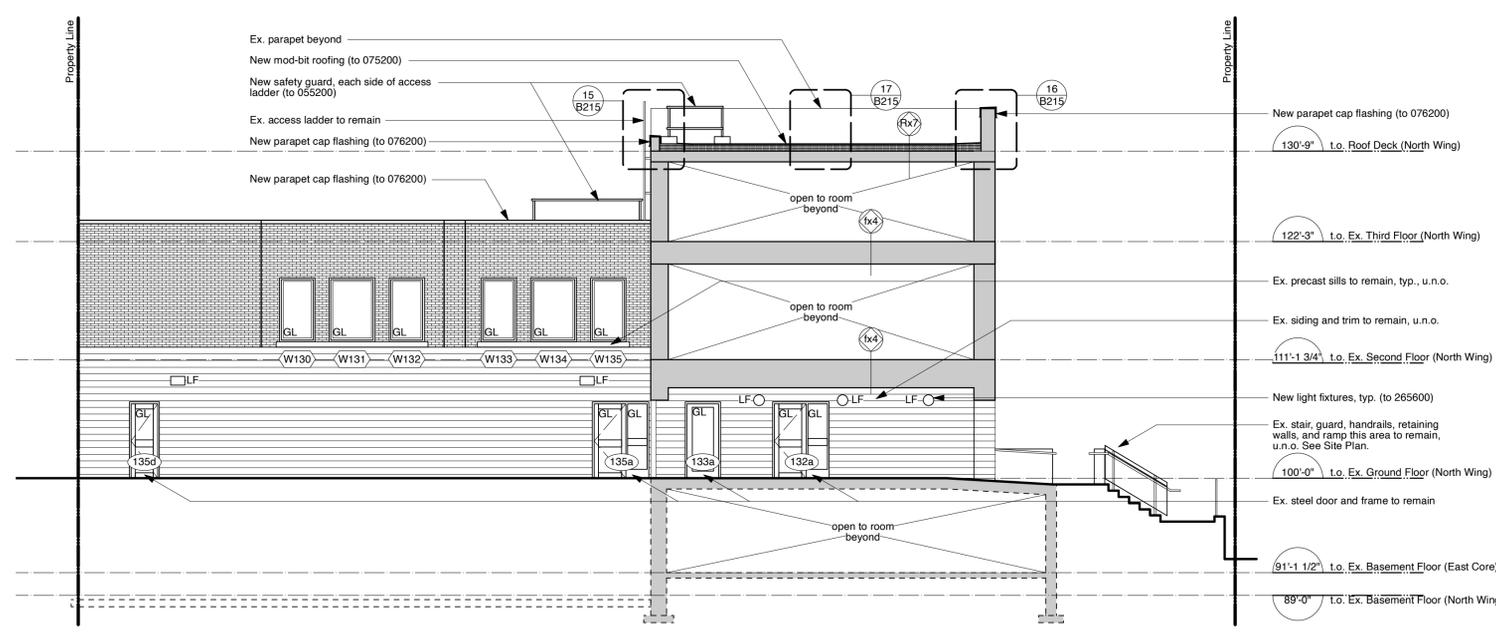
**5 East Interior Elevation**  
1/8" = 1'-0"

**Notes to East Interior Elevation:**

- 5.1 Clean all debris from window wells, typ. Provide new sealant to perimeter of all penetrations and openings.
- 5.2 Provide new window (by Cash Allowance).

**Notes to South Interior Elevation:**

1.1 Reserved.



**1 South Interior Elevation**  
1/8" = 1'-0"

**2 North Interior Elevation**  
1/8" = 1'-0"

**Notes to North Interior Elevation:**

- 2.1 New dryer exhaust vent hood. See also Mechanical documents.
- 2.2 Refurbish and make good existing vent hood. See also Mechanical documents.
- 2.3 Remove existing dryer vent hood. Infill and make good with masonry clay brick to match existing (to Div. 4).
- 2.4 Clean all debris from window wells, typ. Provide new sealant to perimeter of all penetrations and openings.
- 2.5 Provide new window (by Cash Allowance).

**Legend:**

- 1 A301 Building Elevation See A300 series Sheets
- 1 A401 Building Section See A400 series Sheets
- 1 A601 Wall Section See A600 series Sheets
- WF Foundation Wall Type, Wall Type See A000 series Sheets
- FB Floor Types, see A000 series Sheets
- RF Roof Types, see Sheet A215
- PF Partition Type See A000 series Sheets
- CF Ceiling Type See Sheet A501
- 07 Room Numbers See Room Finish Schedule(s)
- 10 Opening Numbers See Opening Schedule(s)
- Wxx Window Type, see A300 Sheets for Window Schedule(s)
- Mxx Millwork Type See A710 series Sheets
- 1.1 Owner Equipment Numbers See Equipment Schedule(s)
- Denotes Existing Assembly
- Denotes Fire Separation
- F.S. Denotes Fire Separation
- F.R.R. Denotes Fire Resistance Rating job check indicates dimension which must be confirmed onsite
- j.c.

**General Notes to Building Elevations:**

Not all cladding materials are necessarily shown. Coordinate with Electrical Documents for all power requirements to exterior luminaires. Where discrepancy exists between the building elevations and the electrical documents, the most stringent condition shall govern. Obtain clarification from Consultant for mounting heights of all devices mounted to exterior assemblies. All dimensions to windows are rough openings. Line of grade is shown diagrammatic. Review existing conditions.

AI denotes Air Intake  
CCTV denotes Security Camera Equipment location.  
EG denotes Exhaust Grille or Ventilation Outlet  
GL denotes Glazing  
GM denotes Gas Meter, by local utility  
LF denotes Light Fixture or Luminaire (see also Electrical Documents)  
LV denotes Louver (to 233000), see also Mechanical Documents for sizes.  
PB denotes Barrier-Free Push Button  
NFHB denotes Non-Freeze Hose Bib, see also mech. docs.  
denotes Brick Re-pointing

**General Notes to Masonry Re-Pointing & Deep Pointing:**

Refer also to Division 04 of the Specifications. Historic Masonry Trade Contractor shall survey all existing brick masonry and shall prepare and submit written conditions reporting to Owner and Consultant. Provide all equipment and temporary measures as may be required to perform survey. Reporting shall identify all areas by level of degradation, and shall include recommendations for masonry including but not limited to categories of:

- high degradation requiring immediate action;
- some degradation, repairs highly recommended;
- minor degradation, repair within 5-10 years; and
- good condition, no action required at this time.

Carry in the Contract Work to:

- replace 500 bricks
- re-point 4,000 lin. ft. of mortar
- deep mortar re-point 1,000 lin. ft.
- temporary measures

Owner will select areas for re-pointing based on reporting. Notwithstanding, areas of masonry re-pointing and deep pointing indicated on the building elevations represent areas requiring immediate repairs this Contract. Provide all re-pointing and deep pointing to such areas. Such areas are included in the above allowance for linear feet of pointing work.

**General Notes to Exterior Light Fixtures/Luminaires (LF):**

Refer also to Electrical Documents. All existing exterior luminaires are to be replaced with new. See also Electrical Lighting Plans and Luminaire Schedules. Provide all modifications to feeds and mountings as may be required, to suit new luminaire selections.

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No.	Issued for Purpose	Date	Initial
1	Window tag reference	Nov 15 '24	MM
2	30% Check Set	Dec 05 '24	MM
3	90% Check Set	Dec 12 '24	MM
T	For Tender	Dec 19 '24	MM

**General Notes:**

For Cover and General Notes see Sheet A001  
For OBC Matrix and Information see Sheet A011  
For WC Accessories OBC Requirements see Sheet A012  
For Assembly Types see Sheet A021  
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For Site Plan see Sheet A121  
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For Window Schedules see Sheet A311  
For Window Coverings Schedule see Sheet A321  
For Ceiling Assembly Types see Sheet A501  
For Wall Sections see A600 series Sheets  
For Stair Plans, & Sections see A700 series Sheets  
For Millwork see A710 series Sheets  
For Openings Schedules see A900 series Sheets  
For Room Finishes Schedules see A910 series Sheets  
For Owner Equipment Schedule see Sheet A921  
For Mechanical Drawings see M series Sheets  
For Electrical Drawings see E series Sheets

No.	Revision	Date	Initial

**Project**  
RoW - 84 Frederick St.  
Renovation & Renewal  
84 Frederick St  
Kitchener, ON

Approved	AD
Checked	MM
Drawing Title	Drawn AJ

**Building Elevations**

Scale (for 24x36" printing) Dwg. No.  
1/8" = 1'-0" A303

**John MacDonald Architect inc**

195 King Street West, Suite 202 Kitchener, ON N2G 1B1  
info@johmacdonaldarchitect.ca (519) 579 1700

Window Coverings Schedule:

#	Room Name	Size (w x h)	Shades			Films		Remarks
			required	blackout	3%	required	type	
W1a	room	39" x 70" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W1b	room	39" x 70" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W2a	room	39" x 70" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W2b	room	39" x 70" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W3a	support	39" x 70" j.c.	Y	-	Y	-	-	Provide new coverings (to 125000).
W3b	support	39" x 70" j.c.	Y	-	Y	-	-	Provide new coverings (to 125000).
W5a	support (quiet room)	39" x 70" j.c.	Y	-	-	-	-	Provide new coverings (to 125000).
W5b	support (quiet room)	39" x 70" j.c.	Y	-	-	-	-	Provide new coverings (to 125000).
W6a	room	39" x 70" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W6b	room	39" x 70" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W7a	office	39" x 70" j.c.	Y	-	Y	-	-	Provide new coverings (to 125000).
W7b	office	39" x 70" j.c.	-	-	-	-	-	-
W9a	room	39" x 70" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W9b	room	39" x 70" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W10a	room	39" x 70" j.c.	Y	Y	-	54"	-	Provide new coverings (to 125000).
W10b	room	39" x 70" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W11a	reception	39" x 70" j.c.	Y	-	Y	-	-	Provide new coverings (to 125000).
W11b	reception	39" x 70" j.c.	Y	-	Y	-	-	Provide new coverings (to 125000).
W12	open staff	72" x 36" j.c.	Y	-	Y	-	-	Provide new coverings (to 125000).
W13a	shower room	26" x 60" j.c.	-	-	-	Y	PRI	Provide new coverings (to 125250).
W13b	shower room	26" x 60" j.c.	-	-	-	Y	PRI	Provide new coverings (to 125250).
W14	room	54" x 72" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W15a	room	44" x 60" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W15b	room	44" x 60" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W16a & 16b	room	90" x 72" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W17a & 17b	intake	90" x 72" j.c.	-	-	-	-	-	Existing to remain.
W18a	room	44" x 60" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W18b	room	44" x 60" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W19a & 19b	room	90" x 72" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W20a	staff area	77" x 72" j.c.	-	-	-	-	-	Existing to remain.
W20b	staff room	49" x 72" j.c.	-	-	-	-	-	Existing to remain.
W21a	room	44" x 60" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W21b	room	44" x 60" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W22a & 22b	room	44" x 60" j.c.	Y	-	-	-	-	Provide new coverings (to 125000).
W23a & 23b	program	90" x 72" j.c.	-	-	-	-	-	Existing to remain.
W24	outreach BF WC	39" x 54" j.c.	-	-	-	Y	PRI	Provide new coverings (to 125250).
W25	nurse	39" x 54" j.c.	-	-	-	Y	PRI	Provide new coverings (to 125250).
W26	nurse	39" x 54" j.c.	-	-	-	Y	PRI	Provide new coverings (to 125250).
W27	living	39" x 54" j.c.	-	-	-	-	-	-
W28	living	39" x 54" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W29	bedroom	39" x 54" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W30	stair 4	34" x 60" j.c.	-	-	-	-	-	-
W31	room	17" x 72" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W34	stair 4	36" x 54" j.c.	-	-	-	-	-	-
W35	stair 4	38" x 72" j.c.	-	-	-	-	-	-
W36	stair 4	50" x 54" j.c.	-	-	-	-	-	-
W37	community room	40" x 72" j.c.	-	-	-	-	-	-
W38	community room	52" x 72" j.c.	-	-	-	-	-	-
W39	community room	40" x 72" j.c.	-	-	-	-	-	-
W40	community room	40" x 72" j.c.	-	-	-	-	-	-
W41	community room	52" x 72" j.c.	-	-	-	-	-	-
W42	community room	40" x 72" j.c.	-	-	-	-	-	-
W43	room	32" x 66" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W44a	kitchen/living	32" x 66" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W44b	kitchen/living	32" x 66" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W45	kitchen/living	72" x 30" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W46	room	32" x 66" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W47	room	32" x 66" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).

Window Coverings Schedule:

#	Room Name	Size (w x h)	Shades			Films		Remarks
			required	blackout	3%	required	type	
W49	room	32" x 66" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W50	room	32" x 66" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W52	kitchen/living	72" x 30" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W53	stair 4	48" x 60" j.c.	-	-	-	-	-	-
W54	room	48" x 60" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W55	room	48" x 60" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W56	room	48" x 60" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W57	room	48" x 60" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W59	room	28" x 60" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W60	stair 5	36" x 54" j.c.	-	-	-	-	-	-
W62	room	28" x 60" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W63	WC	36" x 48" j.c.	-	-	-	Y	PRI	Provide new coverings (to 125250).
W64	room	52" x 60" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W65	stair 5	36" x 54" j.c.	-	-	-	-	-	-
W66	stair 5	36" x 54" j.c.	-	-	-	-	-	-
W67	sleeping	107" x 60" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W68	bedroom	107" x 30" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W70	room	52" x 35" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W71	room	52" x 35" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W72	dining	126" x 66" j.c.	Y	-	Y	-	-	Provide new coverings (to 125000).
W73	room	32" x 35" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W74	room	32" x 35" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W75	laundry	32" x 66" j.c.	-	-	-	Y	PRI	Provide new coverings (to 125250).
W76	laundry	32" x 66" j.c.	-	-	-	Y	PRI	Provide new coverings (to 125250).
W77	electrical room	32" x 66" j.c.	-	-	-	Y	PRI	Provide new coverings (to 125250).
W78	electrical room	32" x 66" j.c.	-	-	-	Y	PRI	Provide new coverings (to 125250).
W79	dish	40" x 66" j.c.	-	-	-	Y	PRI	Provide new coverings (to 125250).
W80	meeting room	39" x 60" j.c.	-	-	-	-	-	-
W81	room	32" x 66" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W82	room	32" x 66" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W83	room	52" x 66" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W84	room	52" x 66" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W85	sleeping	80" x 68" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W86	bedroom	72" x 48" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W87	room	32" x 66" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W88	room	32" x 66" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W89	room	32" x 66" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W90	room	32" x 66" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W91	room	32" x 66" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W92	room	54" x 66" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W93	room	54" x 66" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W94	kitchen	72" x 66" j.c.	-	-	-	Y	PRI	Provide new coverings (to 125250).
W95	kitchen	72" x 66" j.c.	-	-	-	Y	PRI	Provide new coverings (to 125250).
W96	office	40" x 48" j.c.	Y	-	Y	-	-	Provide new coverings (to 125000).
W97	support	52" x 60" j.c.	Y	-	Y	-	-	Provide new coverings (to 125000).
W98	room	32" x 66" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W99	room	32" x 66" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W100	lounge	32" x 66" j.c.	Y	-	Y	-	-	Provide new coverings (to 125000).
W101	storage	32" x 66" j.c.	Y	-	Y	-	-	Provide new coverings (to 125000).
W102	kitchen	52" x 66" j.c.	-	-	-	Y	PRI	Provide new coverings (to 125250).
W103	meeting room	52" x 60" j.c.	Y	-	Y	-	-	Provide new coverings (to 125000).
W104	lounge	32" x 66" j.c.	Y	-	Y	-	-	Provide new coverings (to 125000).
W105	lounge	32" x 66" j.c.	Y	-	Y	-	-	Provide new coverings (to 125000).
W106	servery	52" x 66" j.c.	-	-	-	Y	PRI	Provide new coverings (to 125250).
W107	staff	52" x 60" j.c.	Y	-	Y	-	-	Provide new coverings (to 125000).
W108	lounge	32" x 66" j.c.	Y	-	Y	-	-	Provide new coverings (to 125000).
W109	lounge	32" x 66" j.c.	Y	-	Y	-	-	Provide new coverings (to 125000).
W110	dining	60" x 66" j.c.	Y	-	Y	-	-	Provide new coverings (to 125000).

Window Coverings Schedule:

#	Room Name	Size (w x h)	Shades			Films		Remarks
			required	blackout	3%	required	type	
W111	staff	52" x 60" j.c.	Y	-	Y	-	-	Provide new coverings (to 125000).
W112	room barrier-free	32" x 66" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W113	room barrier-free	32" x 66" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W114	room barrier-free	32" x 66" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W115	room barrier-free	32" x 66" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W116	dining	60" x 66" j.c.	Y	-	Y	-	-	Provide new coverings (to 125000).
W117	office	52" x 60" j.c.	Y	-	Y	-	-	Provide new coverings (to 125000).
W118	room barrier-free	32" x 66" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W119	room barrier-free	32" x 66" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W120	support	60" x 66" j.c.	Y	-	Y	-	-	Provide new coverings (to 125000).
W121	office	32" x 60" j.c.	Y	-	Y	-	-	Provide new coverings (to 125000).
W122	room	32" x 66" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W123	room	32" x 66" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W124	office	32" x 60" j.c.	Y	-	Y	-	-	Provide new coverings (to 125000).
W125	room	32" x 66" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W126	room	32" x 66" j.c.	Y	Y	-	-	-	Provide new coverings (to 125000).
W127	support	60" x 66" j.c.	Y	-	Y	-	-	Provide new coverings (to 125000).
W128	office	52" x 60" j.c.	Y	-	Y	-	-	Provide new coverings (to 125000).
W129	service lift	44" x 45" j.c.	N	-	-	-	-	Provide new coverings (to 125000).
W130	community room	40" x 72" j.c.	-	-	-	-	-	-
W131	community room	52" x 72" j.c.	-	-	-	-	-	-
W132	community room	40" x 72" j.c.	-	-	-	-	-	-
W133	community room	40" x 72" j.c.	-	-	-	-	-	-
W134	community room	52" x 72" j.c.	-	-	-	-	-	-
W135	community room	40" x 72" j.c.	-	-	-	-	-	-
W136	reception	72" x 66" j.c.	Y	-	Y	-	-	Provide new coverings (to 125000).
W140	stair 1	40" x 64" j.c.	-	-	-	-	-	-
W141	stair 1	40" x 64" j.c.	-	-	-	-	-	-
W142	stair 1	40" x 64" j.c.	-	-	-	-	-	-
W143	stair 1	40" x 64" j.c.	-	-	-	-	-	-
W144	stair 1	40" x 64" j.c.	-	-	-	-	-	-

General Notes to Window Coverings:

All window shades shall meet OBC requirements for maximum Flame-spread Rating (FSR), and Smoke Development Classification (SDC). Submit Product test data verifying conformance with such standards.

For requirements of window shades, see also Section 125000.

For requirements of window films, see also Section 125250.

Unless specifically noted otherwise, all window coverings shall be provided (supplied and installed) new this Contract.

All shades in shelter rooms shall be black-out type, and manual cordless operation, for safety.

Dimensions shown are of existing window units.

Job check all dimensions of all finished interior openings, and size window shades to suit.

Job check all dimensions of glazed units of windows, door lites, and door frames, and size window films to suit.

Where existing window finished openings are of a width that will impede or hinder the proper function and/or operation of window shades, provide separate shade units with widths to align with centre of vertical mullions. All such split units are included in the Contract Price.

See also Building Elevations and Window Schedules for requirements for windows.

See also Removals drawings for removal of existing window coverings. Notwithstanding, all existing window covering shall be removed and disposed, excepting on those indicated as existing to remain.

Privacy control films may additionally be

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No.	Issued for Purpose	Date	Initial
1	30% Check Set	Dec. 05 '24	MM
2	90% Check Set	Dec. 12 '24	MM
T	For Tender	Dec. 19 '24	MM

### Notes to Rated Ceilings:

There shall be no penetration in rated ceilings greater than 100cm<sup>2</sup> in area. All penetrations larger than this area shall have continuous rated enclosure above the penetration.

All existing and/or new penetrations through rated assemblies shall be fire-stopped (to 078400). No exceptions.

### Notes to Light Fixtures:

All light fixtures to be located in same position as the existing light fixtures that were removed, except where dimensioned.

### Notes to Speaker System:

Existing speaker system to remain u.n.o. Remove, store, and reinstall upon completion of new ceiling.

### Notes to Fire Alarm Devices:

All ceiling mounted fire alarm devices are existing to remain u.n.o. All horns in sleeping rooms are new. See also Electrical documents.

All ceiling mounted fire alarm devices in corridors with LAP ceilings to be removed, stored, and reinstalled upon completion of new LAP.

### Notes to Basement Floor RCP:

Existing light fixtures, reinstalled to existing locations upon completion of ceiling repairs and finishing.

### Ceiling (c) Types:

#	Section	Description
(c1)		Existing Suspended Lay-in-Panel (LAP) Ceilings: - New acoustic lay-in-panels (to 095100); in - Ex. prefinished steel grid system; c/w - Ex. steel suspension system; suspended from - Ex. floor and/or roof structure above.
(c2)		Reserved
(c3)		Existing Gypsum Board on Existing Structure (Fire Rated Assembly): - 2 (two) layers of 16mm type 'X' wallboard in lieu of 13mm wallboard, to form min. 1.0 hour fire resistance rating, in accordance with OBC S82 component additive method; on - 19mm resilient steel sections @ 400 o.c.; on - steel framing @ max. 1200mm o.c.; c/w - blocking & bracing for all ceiling mounted items (to 061000); - Ex. building structural system above. New paint finishes (to 099000).
(c4)		Existing Plaster on Wood Lath Ceiling on Existing Structure (Fire Rated Assembly):  See also to Room Finish Schedules.
(c5)		Exposed Concrete:  New paint finishes (to 099000).
(c6)		1' x 1' LAP, existing to remain: - New acoustic lay-in-panels (to 095100); in - Ex. prefinished steel grid system; c/w - Ex. steel suspension system; suspended from - Ex. floor and/or roof structure above. See also to Room Finish Schedules.
(c7)		Exposed Concrete or Steel Decking:  New paint finishes (to 099000).
(c8)		Existing Gypsum Board on Existing Structure (Fire Rated Assembly):  New paint finishes (to 099000).
(c9)		New Suspended Lay-in-Panel (LAP) Ceilings: - New acoustic lay-in-panels; within - New prefinished steel grid system; on - New steel suspension system; suspended from - Ex. floor and/or roof structure above.
(c10)		New Gypsum Board on Existing Structure: - 13mm wallboard, taped, sanded & spackled (to 095500); on - 19mm resilient steel sections @ 400 o.c.; on - steel framing @ max. 1200mm o.c.; c/w - blocking & bracing for all ceiling mounted items (to 061000); - Ex. building structural system above.
(c11)		New Gypsum Board on Existing Structure (Fire Rated Assembly): - 2 (two) layers of 16mm type 'X' wallboard in lieu of 13mm wallboard, to form min. 1.0 hour fire resistance rating, in accordance with OBC S82 component additive method; on - 19mm resilient steel sections @ 400 o.c.; on - steel framing @ max. 1200mm o.c.; c/w - blocking & bracing for all ceiling mounted items (to 061000); - Ex. building structural system above. New paint finishes (to 099000).
(c12)		New Suspended Lay-in-Panel (LAP) Ceilings: - New panel plastic (to 095100); in - New prefinished steel grid system; c/w - New steel suspension system; suspended from - Ex. floor and/or roof structure above.

### Legend:

	Building Elevation See A300 series Sheets
	Building Section See A400 series Sheets
	Wall Section See A600 series Sheets
	Foundation Wall Type, Wall Type See A000 series Sheets
	Floor Types, see A000 series Sheets Roof Types, see Sheet A215
	Partition Type See A000 series Sheets
	Ceiling Type See Sheet A501
	Room Numbers See Room Finish Schedule(s)
	Opening Numbers See Opening Schedule(s)
	Window Type, see A300 Series Sheets For Window Schedule(s)
	Millwork Type See A710 series Sheets
	Owner Equipment Numbers See Equipment Schedule(s)
	Denotes Existing Assembly
	Denotes Fire Separation
	F.S. Denotes Fire Separation
	F.R.R. Denotes Fire Resistance Rating
	j.c. job check indicates dimension which must be confirmed onsite

### RCP Legend:

	Mechanical supply diffuser, see also mechanical documents
	Mechanical return grille, see also mechanical documents
	Mechanical exhaust fan, see also mechanical documents
	Surface Mounted Light Fixtures
	Pot light fixture
	Wall sconce light fixture
	Light fixture
	Light fixture (Hidden)
	Light fixture (Night)
	Track light fixture w/ heads
	Emergency light, battery unit w/ heads (2)
	Emergency light, remote head (2)
	Emergency light, remote head (1)
	Exit sign
	Occupancy Sensor
	Heat detector
	Smoke detector
	Audio speaker
	Sprinkler head, pendant type
	Sprinkler head, wall type
	Fire alarm horn
	Fire alarm bell
	Wallboard ceilings (to 092000)
	Suspended Lay-in Acoustic Panel (LAP) ceilings (to 095100)
	Security Camera
	Wifi AP Drop

### General Notes to RCPs:

Where discrepancy exists between the RCPs and the Mechanical and/or Electrical documents, the most stringent and/or onerous condition shall apply.

Layout of all new piping runs parallel and perpendicular to existing building elements. Submit layout to Consultant for acceptance of Consultant and Owner.

Mount exit signs and emergency lighting to an elevation that will ensure they are visible. Do not install exit signs so that they are obstructed by hanging light fixtures or ductwork. Typical all exit sign locations.

a.f.f.	denotes Above Finished Floor
FA	denotes From Above
FB	denotes From Below
TA	denotes To Above
TB	denotes To Below
AH	denotes Access Hatch

### General Notes to Ceiling Assemblies:

Make good all components of all assemblies as required where affected by the Work.

See also Removals Plans.

See also Room Finishes Schedules.

Firestop all penetrations (to 078400) through fire rated ceiling assemblies.

### General Notes:

For Cover and General Notes see Sheet A001  
For OBC Matrix and Information see Sheet A011  
For WC Accessories OBC Requirements see Sheet A012  
For Assembly Types see Sheet A021  
For Sequence of Construction see Sheet A031  
For Site Plan see Sheet A121  
For Floor Plan Removals see A200 series Sheets  
For Floor Plans see A210 series Sheets  
For Roof Plan see Sheet A215  
For Roof Assembly Types see Sheet A215  
For Floor Finishes Plans see A230 series Sheets  
For Building Elevations see A300 series Sheets  
For Ceiling Assembly Types see Sheet A311  
For Window Coverings Schedule see Sheet A321  
For Reflected Ceiling Plans see A500 series Sheets  
For Ceiling Assembly Types see Sheet A501  
For Stair Plans, & Sections see A700 series Sheets  
For Millwork see A710 series Sheets  
For Opening Schedules see A900 series Sheets  
For Room Finishes Schedules see A910 series Sheets  
For Owner Equipment Schedule see Sheet A921

For Mechanical Drawings see M series Sheets  
For Electrical Drawings see E series Sheets



No.	Revision	Date	Initial

### Project

RoW - 84 Frederick St.  
Renovation & Renewal

84 Frederick St  
Kitchener, ON

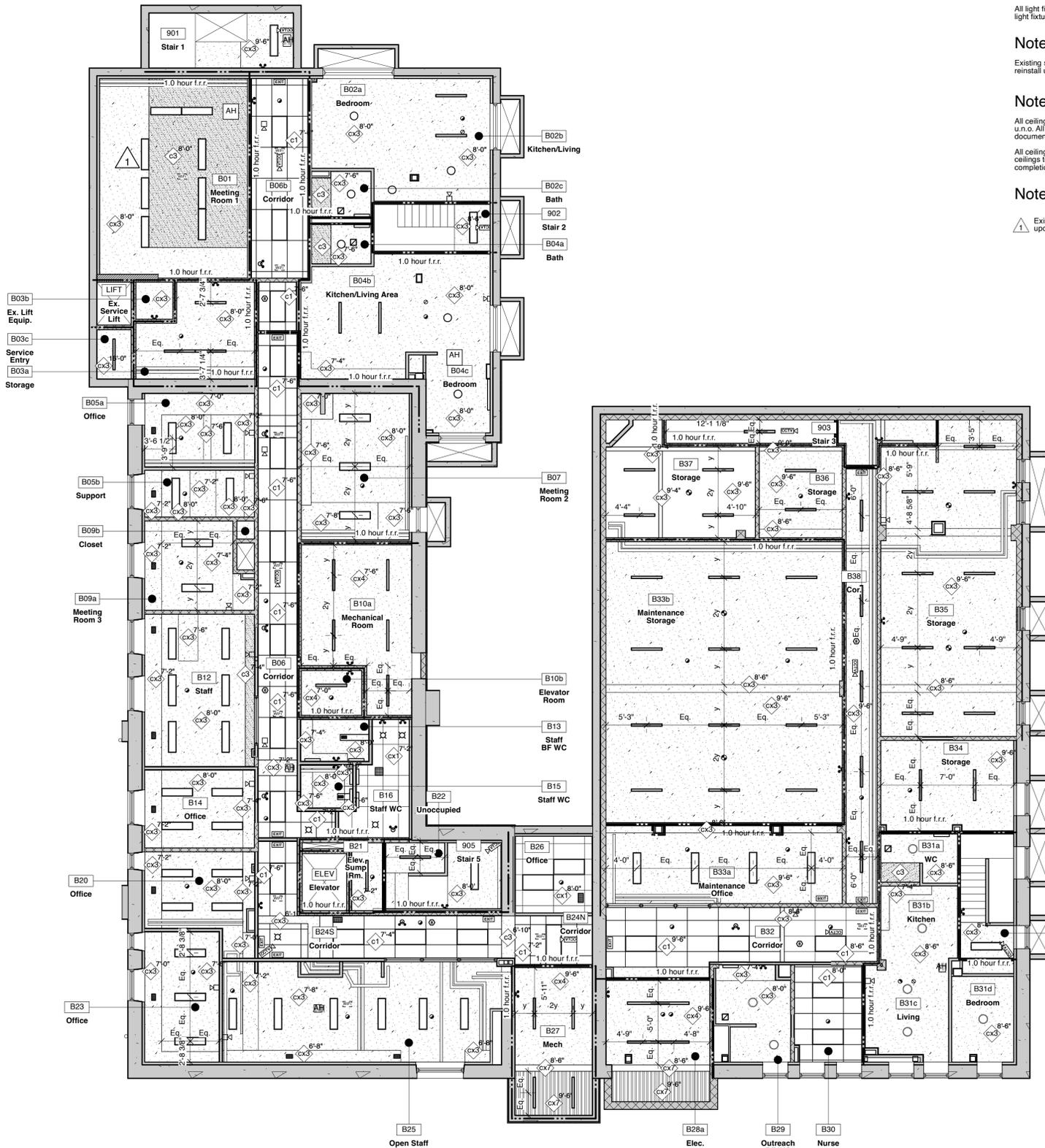
Approved	AD
Checked	MM
Drawing Title	Drawn AJ

Basement Floor  
Reflected Ceiling Plan

Scale (for 24x36" printing) 1/8" = 1'-0"  
Dwg. No. A501

John MacDonald Architect inc

195 King Street West, Suite 202 Kitchener, ON N2G 1B1  
info@johnmacdonaldarchitect.ca (519) 579 1700



1 A501 Basement Floor Reflected Ceiling Plan  
1/8" = 1'-0"

**Notes to Rated Ceilings:**

There shall be no penetration in rated ceilings greater than 100cm<sup>2</sup> in area. All penetrations larger than this area shall have continuous rated enclosure above the penetration.

All existing and/or new penetrations through rated assemblies shall be fire-stopped (to 078400). No exceptions.

**Notes to Light Fixtures:**

All light fixtures to be located in same position as the existing light fixtures that were removed, except where dimensioned.

**Notes to Speaker System:**

Existing speaker system to remain u.n.o. Remove, store, and reinstall upon completion of new ceiling.

**Notes to Fire Alarm Devices:**

All ceiling mounted fire alarm devices are existing to remain u.n.o. All horns in sleeping rooms are new. See also Electrical documents.

All ceiling mounted fire alarm devices in corridors with LAP ceilings to be removed, stored, and reinstalled upon completion of new LAP.

**Notes to Ground Floor RCP:**

1 Existing light fixtures, reinstalled to existing locations upon completion of ceiling repairs and finishing.

2 Patch and make good wallboard ceilings at removals of existing partitions (to 092000).

3 Enclose new STM piping in 1.0 hour rated enclosure consisting of 2 (two) layers type X wallboard on steel stud framing at max. 16" o.c. Side of enclosure shall extend up to u/s of deck, and shall follow profile of deck. Firestop (to 078400).

**Legend:**

- Building Elevation  
See A300 series Sheets
- Building Section  
See A400 series Sheets
- Wall Section  
See A600 series Sheets
- Foundation Wall Type, Wall Type  
See A000 series Sheets
- Floor Types, see A000 series Sheets  
Roof Types, see Sheet A215
- Partition Type  
See A000 series Sheets
- Ceiling Type  
See Sheet A501
- Room Numbers  
See Room Finish Schedule(s)
- Opening Numbers  
See Opening Schedule(s)
- Window Type, see A300 Sheets  
for Window Schedule(s)
- Millwork Type  
See A710 series Sheets
- Owner Equipment Numbers  
See Equipment Schedule(s)
- Denotes Existing Assembly
- Denotes Fire Separation
- Denotes Fire Separation
- Denotes Fire Resistance Rating  
job check indicates dimension  
which must be confirmed onsite
- j.c.

**RCP Legend:**

- Mechanical supply diffuser,  
see also mechanical documents
- Mechanical return grille,  
see also mechanical documents
- Mechanical exhaust fan,  
see also mechanical documents
- Surface Mounted Light Fixtures
- Pot light fixture
- Wall sconce light fixture
- Light fixture
- Light fixture (Hidden)
- Light fixture (Night)
- Track light fixture w/ heads
- Emergency light, battery unit w/ heads (2)
- Emergency light, remote head (2)
- Emergency light, remote head (1)
- Exit sign
- Occupancy Sensor
- Heat detector
- Smoke detector
- Audio speaker
- Sprinkler head, pendant type
- Sprinkler head, wall type
- Fire alarm horn
- Fire alarm bell
- Wallboard ceilings (to 092000)
- Suspended Lay-in Acoustic Panel (LAP)  
ceilings (to 095100)
- Security Camera
- Wifi AP Drop

**General Notes to RCPs:**

Where discrepancy exists between the RCPs and the Mechanical and/or Electrical documents, the most stringent and/or onerous condition shall apply.

Layout of all new piping runs parallel and perpendicular to existing building elements. Submit layout to Consultant for acceptance of Consultant and Owner.

Mount exit signs and emergency lighting to an elevation that will ensure they are visible. Do not install exit signs so that they are obstructed by hanging light fixtures or ductwork. Typical all exit sign locations.

- a.f.f. denotes Above Finished Floor
- FA denotes From Above
- FB denotes From Below
- TA denotes To Above
- TB denotes To Below
- AH denotes Access Hatch

**General Notes:**

For Cover and General Notes see Sheet A001  
For OBC Matrix and Information see Sheet A011  
For WC Accessories OBC Requirements see Sheet A012  
For Assembly Types see Sheet A021  
For Sequence of Construction see Sheet A031  
For Site Plan see Sheet A121  
For Floor Plan Removals see A200 series Sheets  
For Floor Plans see A210 series Sheets  
For Roof Plan see Sheet A215  
For Roof Assembly Types see Sheet A215  
For Floor Finishes Plans see A230 series Sheets  
For Building Elevations see A300 series Sheets  
For Window Schedules see Sheet A311  
For Window Coverings Schedule see Sheet A321  
For Reflected Ceiling Plans see A500 series Sheets  
For Ceiling Assembly Types see Sheet A501  
For Wall Sections see A600 series Sheets  
For Stair Plans, & Sections see A700 series Sheets  
For Millwork see A710 series Sheets  
For Openings Schedules see A800 series Sheets  
For Room Finishes Schedules see A910 series Sheets  
For Owner Equipment Schedule see Sheet A921

For Mechanical Drawings see M series Sheets  
For Electrical Drawings see E series Sheets



No.	Revision	Date	Initial

**Project**  
RoW - 84 Frederick St.  
Renovation & Renewal  
84 Frederick St  
Kitchener, ON

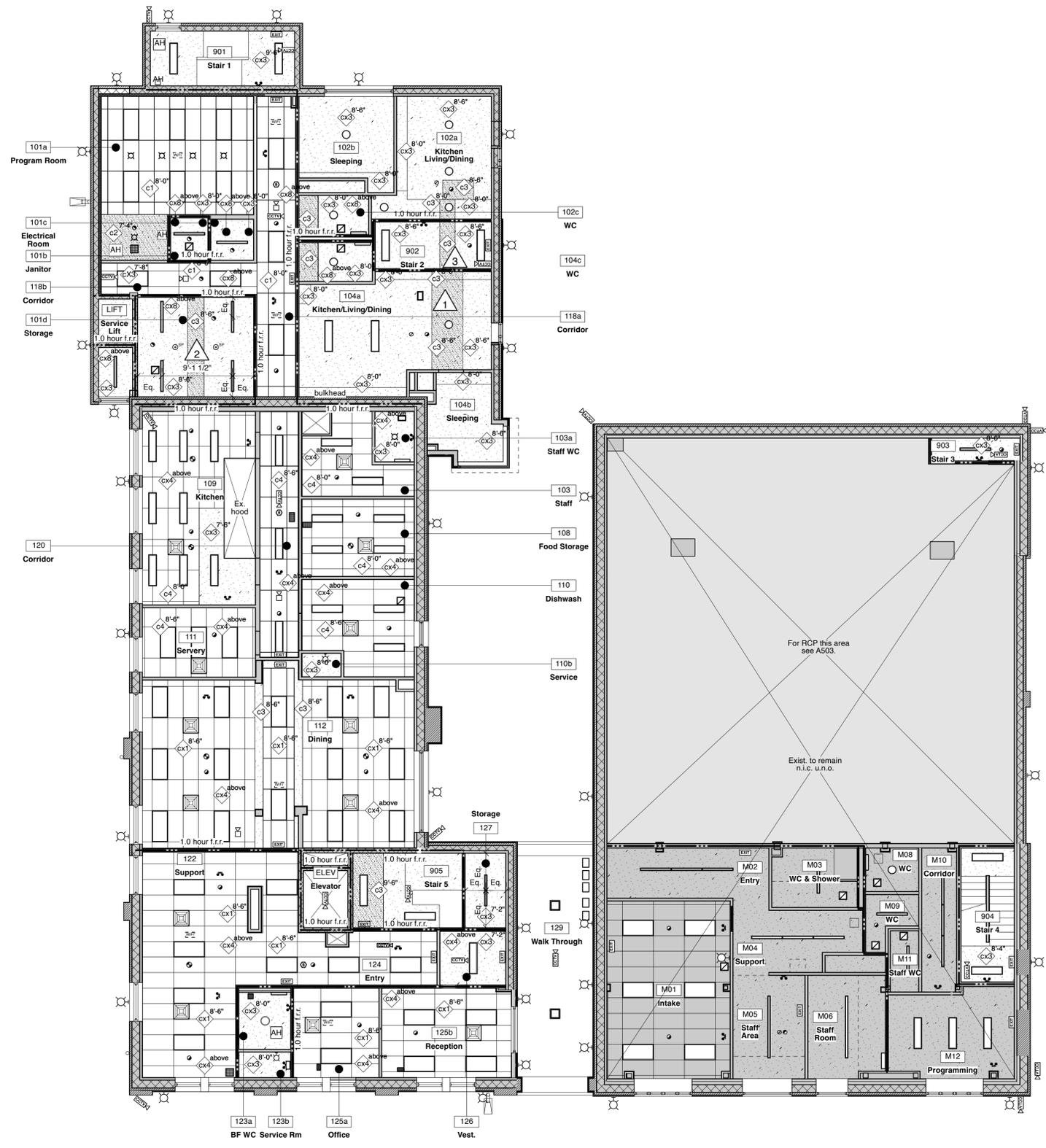
	Approved	AD
	Checked	MM
Drawing Title	Drawn	AJ

**Ground Floor**  
**Reflected Ceiling Plan**

**Scale** (for 24x36" printing) **Dwg. No.**  
1/8" = 1'-0" **A502**

**John MacDonald Architect inc**

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info@johndonaldarchitect.ca (519) 579 1700



**1**  
**A502** Ground Floor Reflected Ceiling Plan  
1/8" = 1'-0"



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**Notes to Rated Ceilings:**

There shall be no penetration in rated ceilings greater than 100cm<sup>2</sup> in area. All penetrations larger than this area shall have continuous rated enclosure above the penetration.

All existing and/or new penetrations through rated assemblies shall be fire-stopped (to 078400). No exceptions.

**Notes to Light Fixtures:**

All light fixtures to be located in same position as the existing light fixtures that were removed, except where dimensioned.

**Notes to Speaker System:**

Existing speaker system to remain u.n.o. Remove, store, and reinstall upon completion of new ceiling.

**Notes to Fire Alarm Devices:**

All ceiling mounted fire alarm devices are existing to remain u.n.o. All horns in sleeping rooms are new. See also Electrical documents.

All ceiling mounted fire alarm devices in corridors with LAP ceilings to be removed, stored, and reinstalled upon completion of new LAP.

**Notes to Third Floor RCP:**

- 1 Patch and make good wallboard ceilings at removals of existing partitions (to 092000).
- 2 Provide new bulkhead this area to conceal hydronic piping. Co-ordinate with Mechanical trade.
- 3 Relocate remote batteries for emergency lighting this location to face of bulkhead.
- 4 Provide access hatch to u/s bulkhead to maintain access to adjacent plumbing shaft.

**Legend:**

- 1 A301 Building Elevation See A300 series Sheets
- 1 A401 Building Section See A400 series Sheets
- 1 A601 Wall Section See A600 series Sheets
- WF# Foundation Wall Type, Wall Type See A000 series Sheets
- FB Floor Types, see A000 series Sheets
- RP Roof Types, see Sheet A215
- PP Partition Type See A000 series Sheets
- CP Ceiling Type See Sheet A501
- 07 Room Numbers See Room Finish Schedule(s)
- 10 Opening Numbers See Opening Schedule(s)
- Wxx Window Type, see A300 Sheets for Window Schedule(s)
- Mxx Millwork Type See A710 series Sheets
- 1.1 Owner Equipment Numbers See Equipment Schedule(s)
- Denotes Existing Assembly
- Denotes Fire Separation
- F.S. Denotes Fire Separation
- F.R.R. Denotes Fire Resistance Rating
- j.c. job check indicates dimension which must be confirmed onsite

**RCP Legend:**

- Mechanical supply diffuser, see also mechanical documents
- Mechanical return grille, see also mechanical documents
- Mechanical exhaust fan, see also mechanical documents
- Surface Mounted Light Fixtures
- Pot light fixture
- Wall sconce light fixture
- Light fixture
- Light fixture (Hidden)
- Light fixture (Night)
- Track light fixture w/ heads
- Emergency light, battery unit w/ heads (2)
- Emergency light, remote head (2)
- Emergency light, remote head (1)
- Exit sign
- Occupancy Sensor
- Heat detector
- Smoke detector
- Audio speaker
- Sprinkler head, pendant type
- Sprinkler head, wall type
- Fire alarm horn
- Fire alarm bell
- Wallboard ceilings (to 092000)
- Suspended Lay-in Acoustic Panel (LAP) ceilings (to 095100)
- Security Camera
- Wifi AP Drop

**General Notes to RCPs:**

Where discrepancy exists between the RCPs and the Mechanical and/or Electrical documents, the most stringent and/or onerous condition shall apply.

Layout of all new piping runs parallel and perpendicular to existing building elements. Submit layout to Consultant for acceptance of Consultant and Owner.

Mount exit signs and emergency lighting to an elevation that will ensure they are visible. Do not install exit signs so that they are obstructed by hanging light fixtures or ductwork. Typical all exit sign locations.

- a.f.f. denotes Above Finished Floor
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**General Notes:**

For Cover and General Notes see Sheet A001  
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 For WC Accessories OBC Requirements see Sheet A012  
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 For Window Schedules see Sheet A311  
 For Window Coverings Schedule see Sheet A321  
 For Reflected Ceiling Plans see A500 series Sheets  
 For Ceiling Assembly Types see Sheet A501  
 For Wall Sections see A600 series Sheets  
 For Stair Plans, & Sections see A700 series Sheets  
 For Millwork see A710 series Sheets  
 For Opening Schedules see A900 series Sheets  
 For Room Finishes Schedules see A910 series Sheets  
 For Owner Equipment Schedule see Sheet A921

For Mechanical Drawings see M series Sheets  
 For Electrical Drawings see E series Sheets



No.	Revision	Date	Initial

**Project**  
 RoW - 84 Frederick St.  
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 84 Frederick St  
 Kitchener, ON

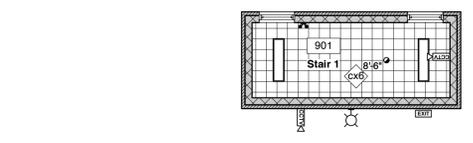
Drawing Title	Approved	Checked	Drawn
	AD	MM	AJ

**Third Floor**  
 Reflected Ceiling Plan

Scale	Dwg. No.
(for 24x36" printing) 1/8" = 1'-0"	A504

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1 Third Floor Reflected Ceiling Plan  
 A504 1/8" = 1'-0"

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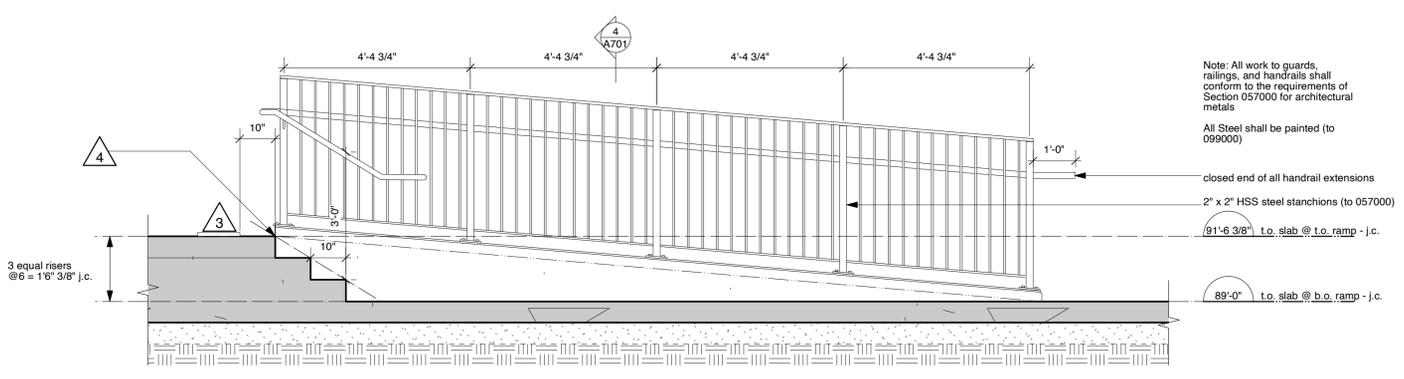
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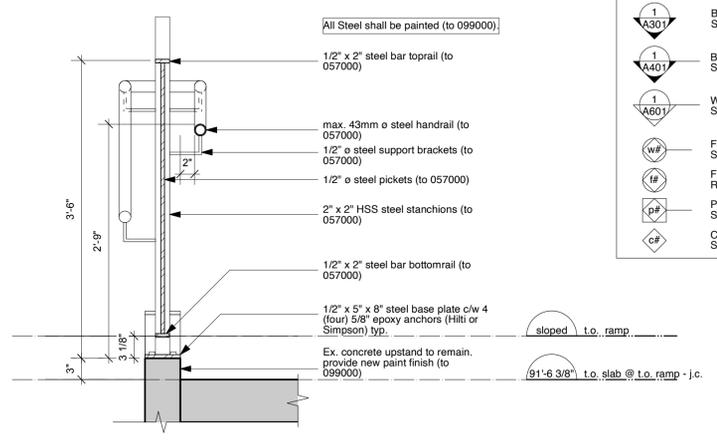
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**Legend:**

	Building Elevation See Room Finish Schedule(s)		Room Numbers See Room Finish Schedule(s)
	Building Section See A400 series Sheets		Opening Numbers See Opening Schedule(s)
	Wall Section See A600 series Sheets		Window Type, see A300 Sheets for Window Schedule(s)
	Foundation Wall Type, Wall Type See A000 series Sheets		Millwork Type See Millwork Detail Drawings
	Floor Type, see A000 series Sheets Roof Type, see Sheet A215		Owner Equipment Numbers See Equipment Schedule(s)
	Partition Type See A000 series Sheets		Denotes Existing Assembly
	Ceiling Type See Sheet A501		Denotes Fire Separation
			Denotes Fire Separation
			Denotes Fire Resistance Rating
			j.c. job check indicates dimension which must be confirmed onsite



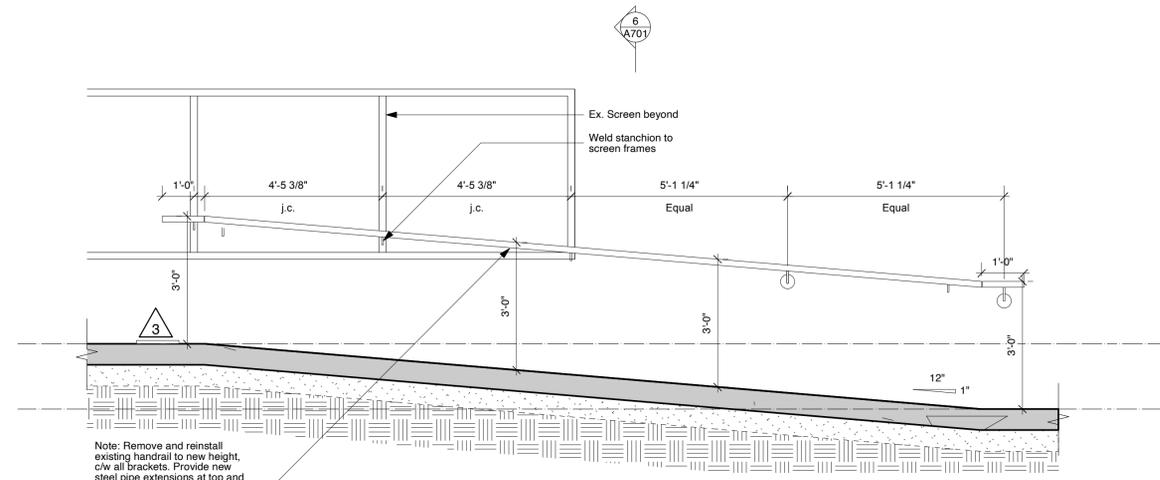
**3 Stair Section @ Basement Stairs**  
1/2" to 1'-0"



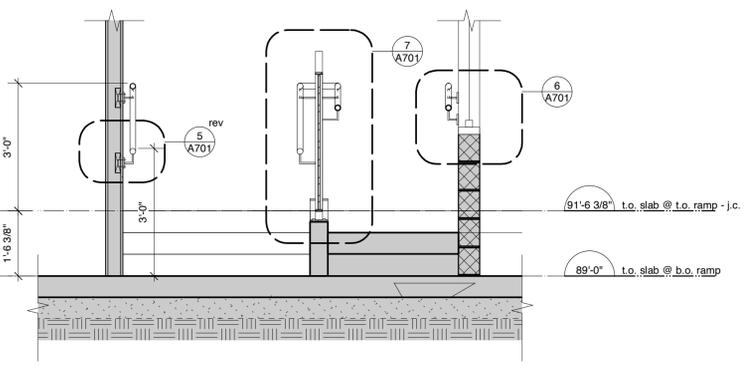
**7 Section Detail @ Ramp Guard and Handrail**  
1" to 10"

**Notes to Stair Details:**

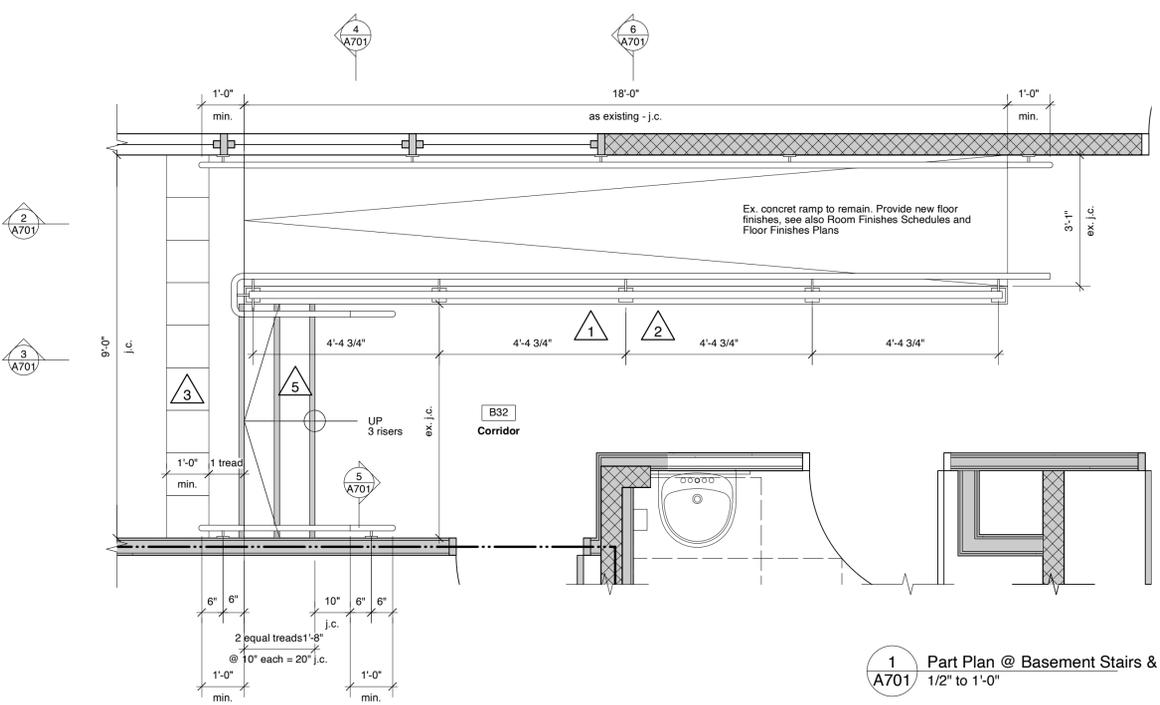
- 1 5/8" (42mm) ø steel handrail (to 057000), painted (to 099000)
- 2"x2" HSS Stanchions c/w 1/2" base plate and 4 (four) 5/8" epoxy anchors (to 057000), painted (to 099000)
- Provide tactile hazard indicators to the stair and the ramp (to 096500)
- Provide colour contrasting nosings strips (to 096500), typ. to all stair nosings
- Provide new rubber stair tread and riser (to 096500), see Floor Finishes Plans.



**2 Ramp Section @ Existing Basement Level Ramp**  
1/2" to 1'-0"



**4 Basement Ramp Cross Section**  
1/2" to 1'-0"



**1 Part Plan @ Basement Stairs & Ramp**  
1/2" to 1'-0"

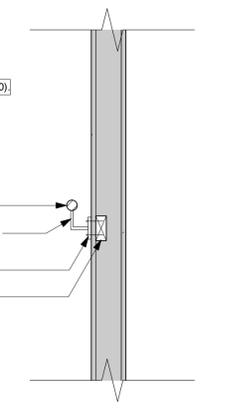
All Steel shall be painted (to 099000).

Note: All work to guards, railings, and handrails shall conform to the requirements of Section 057000 for architectural metals.

max 43mm ø steel handrail (to 057000), painted (to 099000)  
Steel support brackets (to 057000), painted (to 099000) @ max. 4' o.c. and where indicated

3 1/2" ø steel anchor plate c/w min. 3 (three) anchors  
Provide Solid wood blocking (to 061000) between existing framing, typ. each stanchion location

Remove ex. wallboard for installation of blocking, and patch and make good wallboard (to 092000)



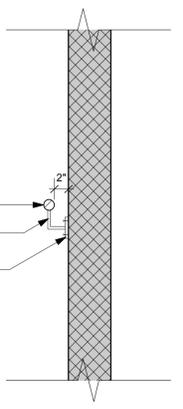
**5 Handrail Detail @ Framed Partition**  
1" to 10"

All Steel shall be painted (to 099000).

Note: All work to guards, railings, and handrails shall conform to the requirements of Section 057000 for architectural metals.

max 43mm ø steel handrail (to 057000), painted (to 099000)  
Steel support brackets (to 057000), painted (to 099000) @ max. 4' o.c. and where indicated

3 1/2" ø steel anchor plate c/w min. 3 (three) anchors.



**6 Handrail Detail @ Block Partition**  
1" to 10"

**General Notes:**

- For Cover and General Notes see Sheet A001
- For OBC Matrix and Information see Sheet A011
- For WC Accessories OBC Requirements see Sheet A012
- For Assembly Types see Sheet A021
- For Sequence of Construction see Sheet A031
- For Site Plan see Sheet A121
- For Floor Plan Removals see A200 series Sheets
- For Floor Plans see A210 series Sheets
- For Roof Plan see Sheet A215
- For Roof Assembly Types see Sheet A215
- For Floor Finishes Plans see A230 series Sheets
- For Building Elevations see A300 series Sheets
- For Window Schedules see Sheet A311
- For Window Coverings Schedule see Sheet A321
- For Reflected Ceiling Plans see A500 series Sheets
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- For Wall Sections see A600 series Sheets
- For Stair Plans, & Sections see A700 series Sheets
- For Millwork see A710 series Sheets
- For Opening Schedules see A800 series Sheets
- For Room Finishes Schedules see A910 series Sheets
- For Owner Equipment Schedule see Sheet A921
- For Mechanical Drawings see M series Sheets
- For Electrical Drawings see E series Sheets



Project North

No.	Revision	Date	Initial
1	30% Check Set	Dec. 05 '24	MM
2	90% Check Set	Dec. 12 '24	MM
T	For Tender	Dec. 19 '24	MM

**Project**

RoW - 84 Frederick St.  
Renovation & Renewal  
84 Frederick St  
Kitchener, ON

Approved	AD
Checked	MM
Drawing Title	Drawn ES

Stair Plans,  
Sections & Details

Scale (for 24x36" printing) as noted  
Dwg. No. A701

John MacDonald Architect inc

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info@johmacdonaldarchitect.ca (519) 579 1700

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The reader shall immediately notify the Architect of all inconsistencies, errors, or omissions which they may discover in this or other documents, or in their relation in whole or in part.

**Legend:**

	Building Elevation See A300 series Sheets		Room Numbers See Room Finish Schedule(s)
	Building Section See A400 series Sheets		Opening Numbers See Opening Schedule(s)
	Wall Section See A600 series Sheets		Window Type, see A300 Sheets for Window Schedule(s)
	Foundation Wall Type, Wall Type See A000 series Sheets		Millwork Type See Millwork Detail Drawings
	Floor Type, see A000 series Sheets Roof Type, see Sheet A215		Owner Equipment Numbers See Equipment Schedule(s)
	Partition Type See A000 series Sheets		Denotes Existing Assembly
	Ceiling Type See Sheet A501		Denotes Fire Separation
			Denotes Fire Separation
			Denotes Fire Resistance Rating
			job check indicates dimension which must be confirmed onsite

**Notes to Stair Details:**

- 1 5/8" ø steel handrail (to 057000), painted (to 099000)
- Reserved
- Provide tactile hazard indicators to full width of the stair (to 096500)
- Provide colour contrasting nosings strips (to 096500), typ. to all stair nosings
- Provide new rubber stair tread and riser (to 096500), see Floor Finishes Plans.

**General Notes:**

For Cover and General Notes see Sheet A001  
 For OBC Matrix and Information see Sheet A011  
 For WC Accessories OBC Requirements see Sheet A012  
 For Assembly Types see Sheet A021  
 For Sequence of Construction see Sheet A031  
 For Site Plan see Sheet A121  
 For Floor Plan Removals see A200 series Sheets  
 For Floor Plans see A210 series Sheets  
 For Roof Plan see Sheet A215  
 For Roof Assembly Types see Sheet A215  
 For Floor Finishes Plans see A230 series Sheets  
 For Building Elevations see A300 series Sheets  
 For Window Schedules see Sheet A311  
 For Window Coverings Schedule see Sheet A321  
 For Reflected Ceiling Plans see A500 series Sheets  
 For Ceiling Assembly Types see Sheet A501  
 For Wall Sections see A600 series Sheets  
 For Stair Plans, & Sections see A700 series Sheets  
 For Millwork see A710 series Sheets  
 For Openings Schedules see A800 series Sheets  
 For Room Finishes Schedules see A910 series Sheets  
 For Owner Equipment Schedule see Sheet A921  
 For Mechanical Drawings see M series Sheets  
 For Electrical Drawings see E series Sheets



No.	Revision	Date	Initial

**Project**

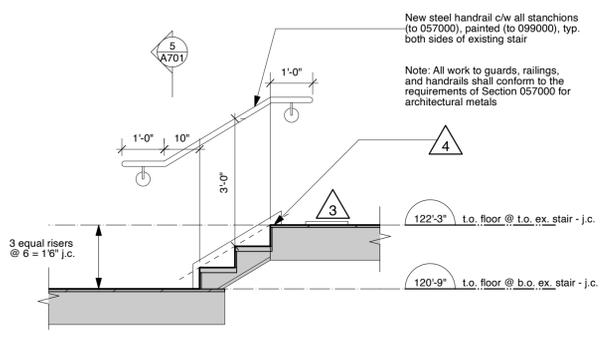
RoW - 84 Frederick St.  
 Renovation & Renewal  
 84 Frederick St  
 Kitchener, ON

Approved	AD
Checked	MM
Drawing Title	Drawn ES

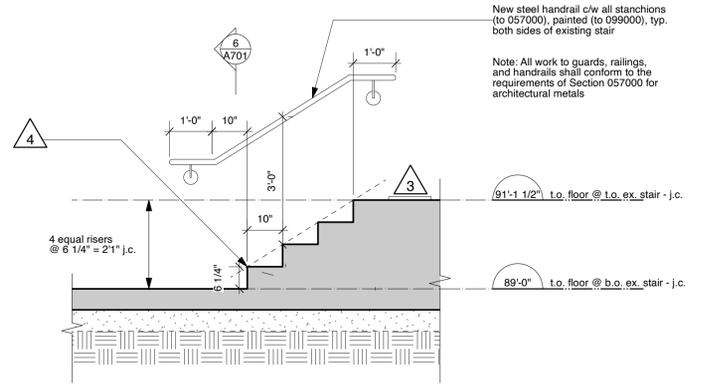
Stair Plans,  
 Sections & Details

Scale (for 24x36" printing)	Dwg. No.
1/2" = 1'-0"	A702

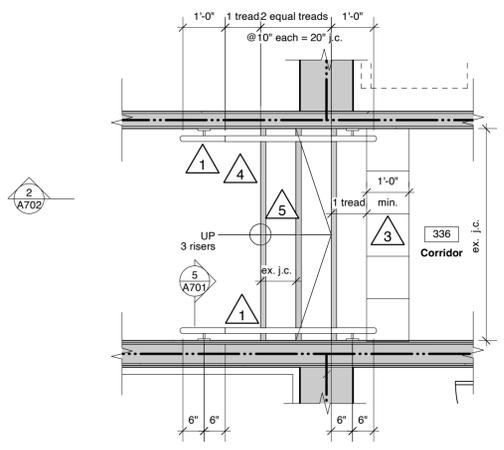
**John MacDonald Architect inc**



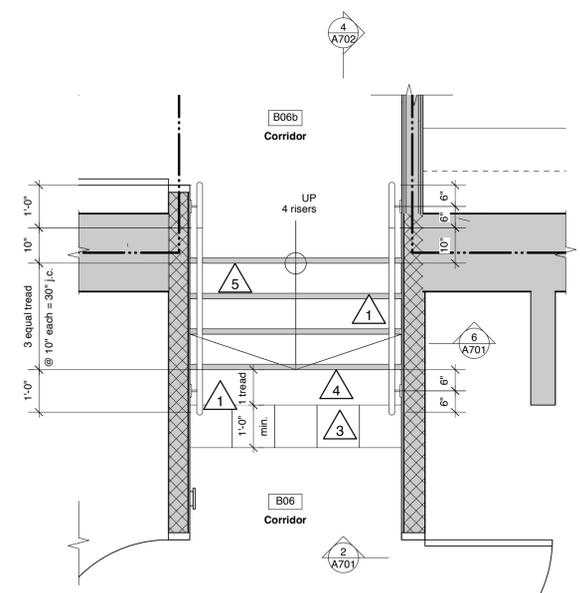
**2 Stair Section @ Existing Third Floor Stairs**  
 A702 1/2" to 1'-0"



**4 Stair Section @ Existing Basement Stairs**  
 A702 1/2" to 1'-0"



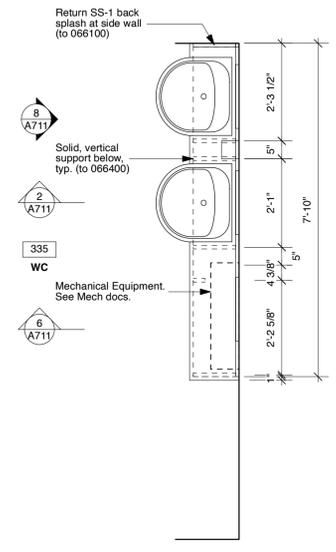
**1 Part Floor Plan @ Existing Third Floor Stairs**  
 A702 1/2" to 1'-0"



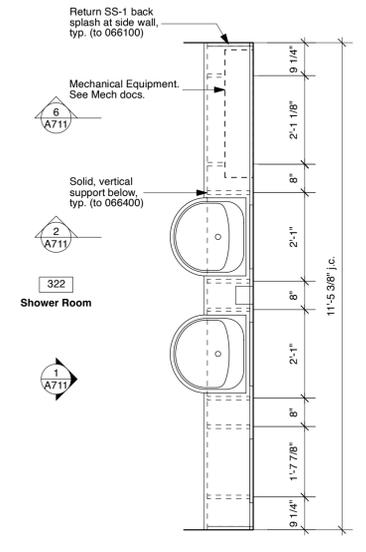
**3 Part Floor Plan @ Existing Basement Stairs**  
 A702 1/2" to 1'-0"

**Legend:**

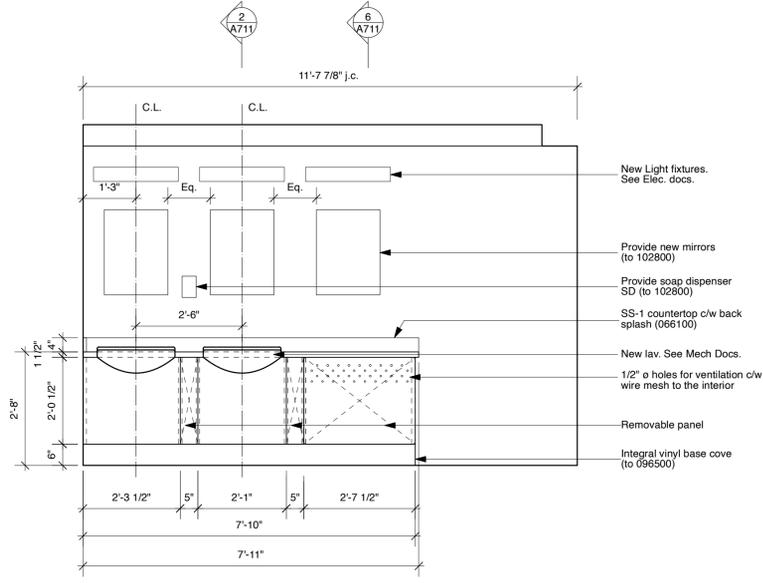
	Building Elevation See A300 series Sheets		Room Numbers See Room Finish Schedule(s)
	Building Section See A400 series Sheets		Opening Numbers See Opening Schedule(s)
	Wall Section See A600 series Sheets		Window Type, see A300 Sheets for Window Schedule(s)
	Foundation Wall Type, Wall Type See A000 series Sheets		Millwork Type See Millwork Detail Drawings
	Floor Type, see A000 series Sheets Roof Type, see Sheet A215		Owner Equipment Numbers See Equipment Schedule(s)
	Partition Type See A000 series Sheets		Denotes Existing Assembly
	Ceiling Type See Sheet A501		Denotes Fire Separation
			Denotes Fire Separation
			Denotes Fire Resistance Rating
			job check indicates dimension which must be confirmed onsite



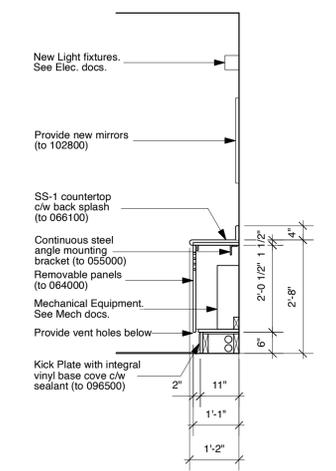
**7**  
A711 M335 Millwork Plan  
1/2" = 1'-0"



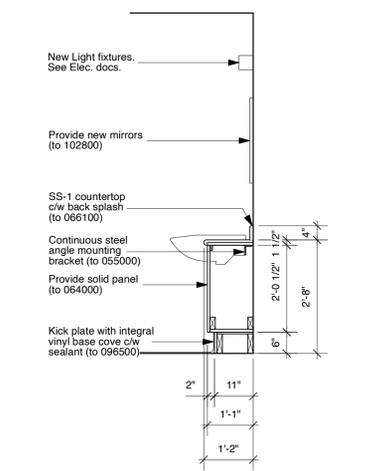
**3**  
A711 M322 Millwork Plan  
1/2" = 1'-0"



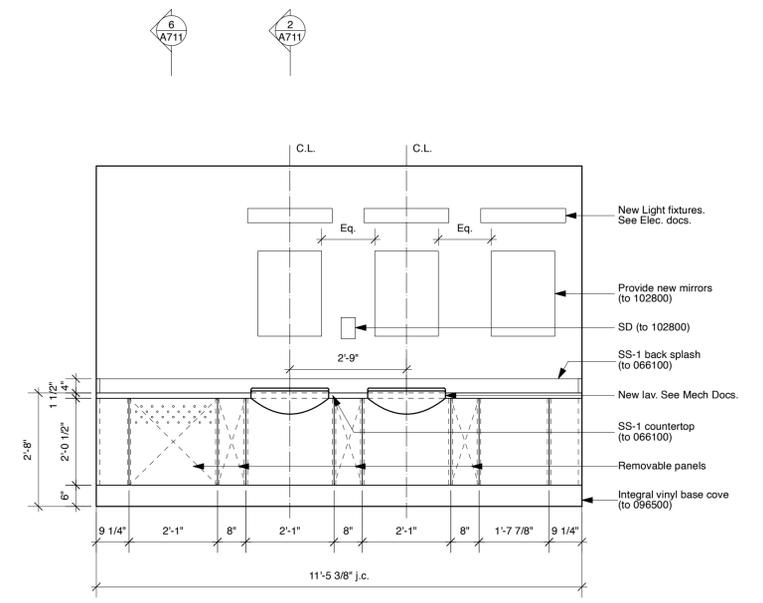
**8**  
A711 M335 Millwork Elevation  
1/2" = 1'-0"



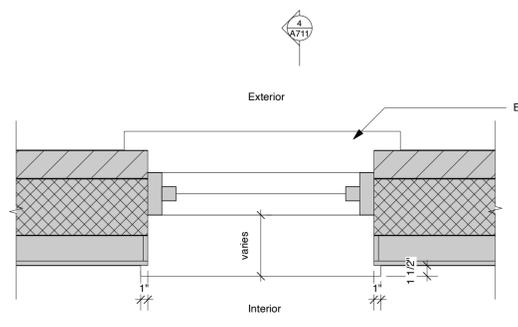
**6**  
A711 Millwork Section, typ.  
1/2" = 1'-0"



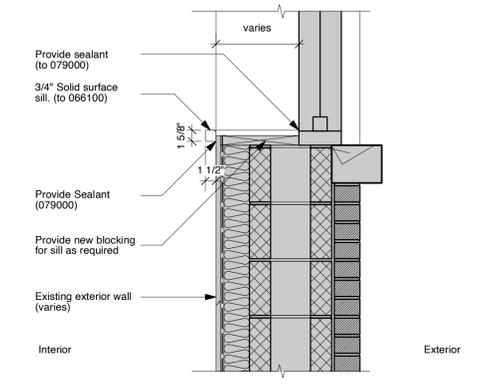
**2**  
A711 Millwork Section, typ.  
1/2" = 1'-0"



**1**  
A711 M322 Millwork Elevation  
1/2" = 1'-0"



**5**  
A711 Window Sill Detail, Typ.  
1" = 1'-0"



**4**  
A711 Window Sill Detail, Typ.  
1" = 1'-0"

No.	Issued For Purpose	Date	Initial
1	90% Check Set	Dec. 12 '24	MM
T	For Tender	Dec. 19 '24	MM

**General Notes:**

For Cover and General Notes see Sheet A001  
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 For Millwork see A710 series Sheets  
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 For Room Finishes Schedules see A910 series Sheets  
 For Owner Equipment Schedule see Sheet A921

For Mechanical Drawings see M series Sheets  
 For Electrical Drawings see E series Sheets



No.	Revision	Date	Initial

**Project**  
 RoW - 84 Frederick St.  
 Renovation & Renewal  
 84 Frederick St  
 Kitchener, ON

Approved AD  
 Checked MM  
 Drawing Title Drawn ES

**Millwork Details**

Scale (for 24x36" printing) Dwg. No.  
 as noted A711

**John MacDonald Architect inc**

**Openings Schedule**

Location		Rating		Frame (to 081113)			Door/Screen (to 081113 & 088000)				Hardware (see 087000)														Building Systems – External Connections													
No.	Room	Room	Assembly	Opening	Type	Material	Finish	Frame Remarks	Leaf	Nominal Size	Handing	Type	Material	Inner Finish	Outer Finish	Door Remarks	Hinge	Function	Trim	ED	Bolt	Stop	CLSR	KP	TH	WS	SWP	ADO & PB's	ES	Acoustic Seal	PTL	Hardware Remarks	120V (by Elec. Trade)	Fire Alarm System	Access Controls	Systems Remarks		
<b>Basement Floor Level</b>																																						
901-B	Corridor	to Stair 1	1.0 HR	45 MIN	F1	HM SUW	PT	New steel frame (to 081113), to suit ex. masonry r.o. painted (to 099000)	1	3'-0" x 7'-0" j.c.	RH	D2	Ex.	PT	PT	New door (to 081113 & 088000), painted (to 099000)	3S	STOR	LEVER	-	-	O/H	-	Y(2)	Y	Y	Y	-	Y	-	-	Provide new hardware (to 087000)	-	-	Y	Y(2)	-	New card reader to operate Mag-lock, FA to release Mag-lock
903-B	Corridor	to Stair 3	1.0 HR	45 MIN	Fx1	Ex. HM	PT	Ex. steel frame to remain to be made good, new paint finish (to 099000)	1	3'-0" x 7'-0" j.c.	LH	Dx1	Ex. HM	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	Ex.	EXIT ONLY	N/A	Ex.	-	-	Ex.	Y(2)	-	-	-	-	Y	-	-	Ex. hardware to remain	-	-	Y	-	Ex.	Connect Mag-lock to FA system
904-B	Kitchen	to Stair 4	1.0 HR	45 MIN	Fx1	Ex. HM	PT	Ex. steel frame to remain to be made good, new paint finish (to 099000)	1	3'-0" x 7'-0" j.c.	LHR	Dx1	Ex. HM	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	3S	STOR	LEVER	-	-	-	Remove Ex.	Y(2)	-	-	-	-	Y	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	Y	-	-	Provide all rough-in & wiring for CR function
905-B	Corridor	to Stair 5	1.0 HR	45 MIN	Fx1	Ex. HM	PT	Ex. steel frame to remain to be made good, new paint finish (to 099000)	1	3'-0" x 7'-0" j.c.	RH	Dx5	Ex. HM	PT	PT	Ex. door to remain, replace glass (to 088000) new paint finish (to 099000)	3S	STOR	LEVER	Y	-	WALL	Remove Ex.	Y(2)	-	-	-	-	Y	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	Y	-	-	Provide all rough-in & wiring for CR function, CR to access basement, exit always from basement
B01	Corridor	to Meeting Room 1	1.0 HR	45 MIN	F1	HM	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	2	3'-0" x 7'-0" j.c.	RH	D1	HM	PT	PT	New door (to 081113), painted (to 099000)	2x3S	STOR	LEVER	-	Y	-	-	Y(4)	-	-	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	Y	-	-	Provide all rough-in & wiring for CR function
B02b	Stair 2	to Kitchen/Living	1.0 HR	45 MIN	Fx1	Ex. HM	PT	Ex. steel frame to remain to be made good, new paint finish (to 099000)	1	3'-0" x 7'-0" j.c.	RH	Dx1	Ex. HM	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	3S	STOR	LEVER	-	-	WALL	-	Ex. (2)	-	-	-	-	Y	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	-	-	-	-
B02c	Kitchen/Living	to Bath	-	-	Fx1	Ex. WD	PT	Ex. wood frame to remain to be made good, new paint finish (to 099000)	1	2'-6" x 6'-8" j.c.	RH	Dx1	Ex. WD	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	Ex.	Ex.	Ex.	-	-	WALL	-	Y(2)	-	-	-	-	-	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	-	-	-	-
B02d	Bedroom	to Corridor	1.0 HR	45 MIN	Fx1	Ex. HM	PT	Ex. frame to remain to be made good, new paint finish (to 099000)	1	3'-0" x 6'-8" j.c.	RHR	Dx1	Ex. HM	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	3S	STOR	LEVER	-	-	WALL	Remove Ex.	Y(2)	Ex.	Ex.	Ex.	-	Y	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	Y	-	-	New card reader to operate Mag-lock, FA to release Mag-lock
B03a	Corridor	to Storage	1.0 HR	45 MIN	F1	HM	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	3'-0" x 7'-0" j.c.	LH	D1	HM	PT	PT	New door (to 081113), painted (to 099000)	3	STOR	LEVER	-	-	WALL	Y	Y(2)	-	-	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	Y	-	-	Provide all rough-in & wiring for CR function
B03b	Ex. Lift Equip.	to Storage	1.0 HR	45 MIN	Fx1	Ex. HM	PT	Ex. steel frame to remain to be made good, new paint finish (to 099000)	1	3'-0" x 7'-0" j.c.	RHR	Dx1	Ex. HM	PT	PT	Ex. doors to remain, to be made good, provide new paint finish (to 099000)	Ex.	Ex.	Ex.	-	-	-	Ex.	Ex.	-	-	-	-	-	-	-	Ex. hardware to remain	-	-	-	-	-	-
B03c	Exterior	to Service Entry	-	-	F1	IHM SUW	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	3'-0" x 7'-0" j.c.	RHR	D1	IHM	PT	PT	New door (to 081113 & 088000), painted (to 099000)	3	ENTRY	LEVER	-	-	-	Y	Y(2)	Y	Y	Y	-	Y	-	-	Provide new hardware (to 087000)	-	-	Y	Y	-	Provide all rough-in & wiring for CR function
B04a	Kitchen/Living	to Bath	-	-	Fx1	Ex. WD	PT	Ex. wood frame to remain to be made good, new paint finish (to 099000)	1	2'-6" x 6'-8" j.c.	RH	Dx1	Ex. WD	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	Ex.	Ex.	Ex.	-	-	WALL	-	Y(2)	-	-	-	-	-	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	-	-	-	-
B04b	Stair 2	to Kitchen/Living	1.0 HR	45 MIN	Fx1	Ex. HM	PT	Ex. steel frame to remain to be made good, new paint finish (to 099000)	1	3'-0" x 7'-0" j.c.	LH	Dx1	Ex. HM	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	3S	STOR	LEVER	-	-	WALL	-	Ex. (2)	-	-	-	-	Y	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	-	-	-	-
B04c	Kitchen/Living	to Corridor	1.0 HR	45 MIN	Fx1	Ex. WD	PT	Ex. wood frame to remain to be made good, new paint finish (to 099000)	1	3'-0" x 6'-8" j.c.	RHR	Dx1	Ex. HM	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	3S	STOR	LEVER	-	-	WALL	Remove Ex.	Y(2)	Ex.	Ex.	Ex.	-	Y	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	Y	Y	-	New card reader to operate Mag-lock, FA to release Mag-lock
B04d	Closet	to Bedroom	-	-	Fx1	Ex. WD	PT	Ex. wood frame to remain to be made good, new paint finish (to 099000)	1	2'-0" x 6'-8" j.c.	LHR	bi-fold	Ex. WD	PT	PT	Ex. doors to remain, to be made good, provide new paint finish (to 099000)	Ex.	Ex.	Ex.	-	-	-	-	-	-	-	-	-	-	-	-	Existing hardware to remain	-	-	-	-	-	-
B05a	Corridor	to Office	-	-	F1	HM	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	3'-0" x 6'-8" j.c.	LH	D2	HM	PT	PT	New door (to 081113 & 088000), painted (to 099000)	3	STOR	LEVER	-	-	WALL	-	Y	-	-	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	Y	-	-	Provide all rough-in & wiring for CR function
B05b	Corridor	to Support	-	-	F1	HM	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	3'-0" x 6'-8" j.c.	LH	D2	HM	PT	PT	New door (to 081113 & 088000), painted (to 099000)	3	STOR	LEVER	-	-	WALL	-	Y	-	-	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	Y	-	-	Provide all rough-in & wiring for CR function
B06	Corridor	to Corridor	1.0 HR	45 MIN	Fx1	Ex. HM	PT	Ex. steel frame to remain to be made good, new paint finish (to 099000)	1	3'-0" x 6'-8" j.c.	LH	D2	HM	PT	PT	New door (to 081113 & 088000), painted (to 099000)	3S	PASS	LEVER	Y	-	WALL	-	Y(2)	-	-	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	-	-	-	-
B07	Corridor	to Meeting Room 2	-	-	F1	HM	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	3'-0" x 6'-8" j.c.	LH	D1	HM	PT	PT	New door (to 081113), painted (to 099000)	3	STOR	LEVER	-	-	-	-	Y(2)	-	-	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	Y	-	-	Provide all rough-in & wiring for CR function
B09a	Corridor	to Meeting Room 3	-	-	F1	HM	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	2'-8" x 6'-8" j.c.	LH	D2	HM	PT	PT	New door (to 081113 & 088000), painted (to 099000)	3	STOR	LEVER	-	-	-	-	Y	-	-	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	Y	-	-	Provide all rough-in & wiring for CR function
B09b	Closet	to Meeting Room 3	-	-	Fx1	Ex. HM	PT	Ex. steel frame to remain to be made good, new paint finish (to 099000)	1	2'-0" x 6'-8" j.c.	LHR	Dx1	Ex. HM	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	Ex.	PASS	LEVER	-	-	WALL	-	Y(2)	-	-	-	-	-	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	-	-	-	-
B10a	Corridor	to Mechanical Room	1.0 HR	45 MIN	F1	HM	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	3'-0" x 6'-8" j.c.	LH	D1	HM	PT	PT	New door (to 081113), painted (to 099000)	3	STOR	LEVER	-	-	O/H	Y	Y(2)	Y	Y	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	Y	-	-	Provide all rough-in & wiring for CR function
B10b	Elevator Room	to Mechanical Room	1.0 HR	45 MIN	Fx1	Ex. HM	PT	Ex. steel frame to remain to be made good, new paint finish (to 099000)	1	3'-0" x 6'-8" j.c.	RHR	Dx1	Ex. HM	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	Ex.	Ex.	Ex.	-	-	Ex.	Ex.	Ex.	Ex.	-	-	-	-	-	-	Existing hardware to remain	-	-	-	-	-	-
B12a	Corridor	to Staff	-	-	F1	HM	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	3'-0" x 6'-8" j.c.	RH	D1	HM	PT	PT	New door (to 081113), Painted (to 099000)	3	STOR	LEVER	-	-	-	-	Y(2)	-	-	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	Y	-	-	Provide all rough-in & wiring for CR function
B12b	Staff	to Corridor	-	-	SCN1	Ex. HM	PT	Ex. steel frame to remain to be made good, new paint finish (to 099000)	1	6'-4" x 6'-8" j.c.	-	-	-	-	-	Ex. glazing to remain	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B13	Corridor	to Staff BF WC	-	-	F1	HM	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	3'-2" x 6'-8" j.c.	LH	D1	HM	PT	PT	New door (to 081113), Painted (to 099000)	3S	ENTRY (KEY PRI)	LEVER	-	-	WALL	-	Y(2)	-	-	-	Y	-	Y	-	Provide new hardware (to 087000)	Y	-	Y	-	-	Provide all rough-in & wiring for CR function
B14	Corridor	to Office	-	-	F1	HM	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	3'-0" x 6'-8" j.c.	RH	D1	HM	PT	PT	New door (to 081113), Painted (to 099000)	3	STOR	LEVER	-	-	-	-	Y(2)	-	-	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	Y	-	-	Provide all rough-in & wiring for CR function
B15	Corridor	to Staff WC	-	-	Fx1	Ex. HM	PT	Ex. steel frame to remain to be made good, new paint finish (to 099000)	1	2'-8" x 6'-8" j.c.	LHR	Dx1	Ex. WD	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	3S	ENTRY (KEY PRI)	LEVER	-	-	-	-	Y(2)	-	-	-	Y	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	Y	-	-	Provide all rough-in & wiring for CR function	
B16	Corridor	to Staff WC	-	-	Fx1	Ex. HM	PT	Ex. steel frame to remain to be made good, new paint finish (to 099000)	1	2'-8" x 6'-8" j.c.	LH	Dx1	Ex. WD	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	3S	STOR	LEVER	-	-	WALL	Remove Ex.	Ex.	Ex.	-	-	-	Y	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	Y	-	-	Provide all rough-in & wiring for CR function
B20	Open Staff	to Office	-	-	Fx1	Ex. HM	PT	Ex. steel frame to remain to be made good, new paint finish (to 099000)	1	3'-0" x 6'-8" j.c.	RH	Dx1	Ex. WD	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	Ex.	PASS	LEVER	-	-	WALL	-	Y	-	-	-	-	Y	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	Y	-	-	Provide all rough-in & wiring for CR function
B21	Corridor	to Elevator Sump Room	1.0 HR	45 MIN	Fx1	Ex. HM	PT	Ex. steel frame to remain for modification, new paint finish (to 099000)	1	2'-6" x 7'-0" j.c.	LH	Dx1	Ex. HM	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	Ex.	STOR	LEVER	-	-	Ex.	Ex.	Ex.	-	-	-	-	Y	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	Y	-	-	Provide all rough-in & wiring for CR function
B22	Unoccupied	to Stair 5	-	-	Fx1	Ex. HM	PT	Ex. steel frame to remain for modification, new paint finish (to 099000)	1	2'-6" x 7'-0" j.c.	RHR	Dx1	Ex. HM	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	3S	STOR	LEVER	-	-	-	Remove Ex.	Y(2)	-	-	-	-	Y	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	Y	-	-	Provide all rough-in & wiring for CR function
B23	Open Staff	to Office	-	-	Fx3	Ex. HM	PT	Ex. steel frame to remain to be made good, new paint finish (to 099000)	1	3'-0" x 6'-8" j.c.	RH	Dx1	Ex. WD	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	Ex.	PASS	LEVER	-	-	-	-	Y(2)	-	-	-	-	Y	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	Y	-	-	Provide all rough-in & wiring for CR function
B24S																																						

# Openings Schedule

Location		Rating	Frame (to 081113)	Door/Screen (to 081113 & 088000)										Hardware (see 087000)										Building Systems - External Connections														
No.	Room	Room	Assembly	Opening	Type	Material	Finish	Frame Remarks	Leaf	Nominal Size	Handing	Type	Material	Inner Finish	Outer Finish	Door Remarks	Hinge	Function	Trim	ED	Bolt	Stop	CLSR	KP	TH	WS	SWP	ADO & PB's	ES	Acoustic Seal	PTL	Hardware Remarks	120V (by Elec. Trade)	Fire Alarm System	Access Controls	Systems Remarks		
901-1	Stair 1	to Exterior	-	-	F1	Ex. IHM	PT	Ex. frame to remain, provide new paint finish (to 099000)	1	3'-0" x 7'-0" j.c.	RH	Dx1	Ex.	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	Ex.	STOR	LEVER	Ex.	-	-	Y	Y(2)	Ex.	Ex.	Ex.	-	Y	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	-	Y	Y	Provide all rough-in & wiring for CR function
902-1	Exterior	to Stair 2	-	-	Fx2	Ex. WD	PT	Ex. frame to remain, provide new paint finish (to 099000)	1	3'-0" x 6'-8" j.c.	RHR	Dx3	Ex. ST	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	3S	STOR	LEVER	Y	-	-	-	Y(2)	Ex.	Ex.	Ex.	-	Y	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	-	Y	Y	Provide all rough-in & wiring for CR function
903-1	Stair 3	to Exterior	-	-	Fx1	Ex. IHM	PT	Ex. frame to remain, provide new paint finish (to 099000)	1	3'-0" x 7'-0" j.c.	LH	Dx1	Ex. HM	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	3S	EXIT	Escutcheon	Y	-	-	-	Y(2)	Ex.	Ex.	Ex.	-	Y	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	-	Y	Y	Connect Mag-lock to FA system
904-1	Stair 4	to Exterior	-	-	Fx1	Ex.	PT	Ex. frame to remain, provide new paint finish (to 099000)	1	3'-0" x 7'-0" j.c.	LH	Dx3	Ex. HM	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	3S	STOR	LEVER	Y	-	-	-	Y(2)	Ex.	Ex.	Ex.	-	Y	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	-	Y	Y	Provide all rough-in & wiring for CR function
905-1	Entry	to Stair 5	1.0 HR	45 MIN	Fx1	Ex. HM	PT	Ex. frame to remain, provide new paint finish (to 099000)	1	3'-0" x 7'-0" j.c.	LH	Dx5	Ex. HM	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	3S	PASS	LEVER	Y	-	-	Remove Ex.	Y(2)	-	-	-	-	-	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	-	-	-	-
101a	Corridor	to Program Room	-	-	F1	HM SUW	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	3'-2" x 7'-0"	RH	D2	HM	PT	PT	New door (to 081113 & 088000), painted (to 099000)	3	CLASS	LEVER	-	-	WALL	-	-	-	Y	-	-	-	-	-	Provide new hardware (to 087000)	-	-	-	Y	-	Provide all rough-in & wiring for CR function
101b	Janitor	to Corridor	1.0 HR	45 MIN	Fx1	Ex. HM	PT	Ex. steel frame to remain for modification, new paint finish (to 099000)	1	3'-0" x 7'-0" j.c.	LHR	Dx1	Ex. HM	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	Ex.	STOR	LEVER	-	-	-	-	-	-	-	-	-	-	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	-	Y	-	Provide all rough-in & wiring for CR function
101c	Electrical Room	to Corridor	-	-	Fx1	Ex. HM	PT	Ex. steel frame to remain for modification, new paint finish (to 099000)	1	3'-0" x 7'-0" j.c.	LHR	Dx1	Ex. HM	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	Ex.	STOR	LEVER	-	-	-	-	-	-	-	-	-	-	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	-	Y	-	Provide all rough-in & wiring for CR function
101d	Corridor	to Storage	1.0 HR	45 MIN	Fx1	Ex. HM	PT	Ex. steel frame to remain for modification, new paint finish (to 099000)	1	3'-0" x 7'-0" j.c.	RH	Dx1	Ex. HM	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	Ex.	STOR	LEVER	-	-	-	-	-	-	-	-	-	-	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	-	Y	-	Provide all rough-in & wiring for CR function
101e	Corridor	to Storage	1.0 HR	45 MIN	F1	HM SUW	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	3'-2" x 7'-0"	LH	D1	HM	PT	PT	New door (to 081113), painted (to 099000)	3	STOR	LEVER	-	-	O/H	-	-	-	Y	-	-	-	-	-	Provide new hardware (to 087000)	-	-	-	Y	-	Provide all rough-in & wiring for CR function
101f	Corridor	to Program Room	-	-	F1	HM SUW	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	3'-2" x 7'-0"	LH	D2	HM	PT	PT	New door (to 081113 & 088000), painted (to 099000)	3	CLASS	LEVER	-	-	O/H	-	-	-	Y	-	-	-	-	-	Provide new hardware (to 087000)	-	-	-	Y	-	Provide all rough-in & wiring for CR function
102a	Stair 2	to Kitchen/Living/Dining	1.0 HR	45 MIN	Fx1	Ex. HM	PT	Ex. steel frame to remain to be made good, new paint finish (to 099000)	1	3'-0" x 7'-0" j.c.	RH	Dx1	Ex. HM	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	Ex.	ENTRY	LEVER	-	-	WALL	-	-	-	-	-	-	-	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	-	-	-	-
102b	Kitchen/Living/Dining	to Sleeping	-	-	Fx1	Ex. WD	PT	Ex. wood frame to remain to be made good, new paint finish (to 099000)	1	2'-6" x 6'-8" j.c.	RH	Dx1	Ex. WD	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	Ex.	Ex.	Ex.	-	-	WALL	-	-	-	-	-	-	-	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	-	-	-	-
102c	Kitchen/Living/Dining	to WC	-	-	Fx1	Ex. WD	PT	Ex. wood frame to remain to be made good, new paint finish (to 099000)	1	2'-6" x 6'-8" j.c.	RH	Dx1	Ex. WD	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	Ex.	Ex.	Ex.	-	-	WALL	-	-	-	-	-	-	-	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	-	-	-	-
102d	Closet	to Sleeping	-	-	Fx1	Ex. WD	PT	Ex. wood frame to remain to be made good, new paint finish (to 099000)	2	3'-0" x 6'-8" j.c.	RHR/ LHR	bi-fold	Ex. WD	PT	PT	Ex. doors to remain, to be made good, provide new paint finish (to 099000)	Ex.	Ex.	Ex.	-	-	-	-	-	-	-	-	-	-	-	-	Existing hardware to remain	-	-	-	-	-	-
102e	Exterior	to Kitchen/Living/Dining	-	-	Fx1	Ex. WD	PT	Ex. wood frame to remain to be made good, new paint finish (to 099000)	1	3'-0" x 6'-8" j.c.	RHR	Dx3	Ex. ST	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	Ex.	ENTRY	LEVER	Y	-	WALL	-	-	-	-	-	-	-	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	-	Y	-	Provide all rough-in & wiring for CR function
103	Corridor	to Staff	-	-	Fx1	Ex. HM	PT	Ex. steel frame to remain to be made good, new paint finish (to 099000)	1	3'-0" x 7'-0" j.c.	LH	Dx1	Ex. HM	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	3S	PASS	LEVER	-	-	WALL	-	-	-	-	-	-	-	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	-	-	-	-
103a	Staff	to Staff WC	-	-	Fx1	Ex. HM	PT	Ex. steel frame to remain to be made good, new paint finish (to 099000)	1	2'-8" x 7'-0" j.c.	RH	D1	HM	PT	PT	New door (to 081113), painted (to 099000)	3	PRI	LEVER	-	-	O/H	-	-	-	-	-	-	-	-	-	Provide new hardware (to 087000)	-	-	-	-	-	-
104a	Stair 2	to Kitchen/Living/Dining	1.0 HR	45 MIN	Fx1	Ex. HM	PT	Ex. steel frame to remain to be made good, new paint finish (to 099000)	1	3'-0" x 7'-0" j.c.	LH	Dx1	Ex. HM	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	Ex.	ENTRY	LEVER	-	-	WALL	-	-	-	-	-	-	-	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	-	-	-	-
104b	Exterior	to Kitchen/Living/Dining	-	-	Fx1	Ex. WD	PT	Ex. wood frame to remain to be made good, new paint finish (to 099000)	1	3'-0" x 6'-8" j.c.	LHR	Dx3	Ex. ST	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	Ex.	ENTRY	LEVER	Y	-	WALL	-	-	-	-	-	-	-	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	-	Y	-	Provide all rough-in & wiring for CR function
104c	Kitchen/Living/Dining	to WC	-	-	Fx1	Ex. WD	PT	Ex. wood frame to remain to be made good, new paint finish (to 099000)	1	2'-6" x 6'-8" j.c.	RH	Dx1	Ex. WD	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	Ex.	Ex.	Ex.	-	-	WALL	-	-	-	-	-	-	-	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	-	-	-	-
104d	Closet	to Sleeping	-	-	Fx1	Ex. WD	PT	Ex. wood frame to remain to be made good, new paint finish (to 099000)	1	2'-0" x 6'-8" j.c.	LHR	bi-fold	Ex. WD	PT	PT	Ex. doors to remain, to be made good, provide new paint finish (to 099000)	Ex.	Ex.	Ex.	-	-	-	-	-	-	-	-	-	-	-	-	Existing hardware to remain	-	-	-	-	-	-
108a	Corridor	to Food Storage	-	-	Fx1	Ex. HM	PT	Ex. steel frame to remain to be made good, new paint finish (to 099000)	1	3'-0" x 7'-0" j.c.	RH	Dx2	Ex. HM	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	Ex.	PASS	LEVER	-	-	-	-	-	-	-	-	-	-	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	-	-	-	-
108b	Exterior	to Food Storage	-	-	F1	IHM SUW	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	3'-0" x 7'-0"	RHR	D3	IHM	PT	PT	New door (to 081113 & 088000), painted (to 099000)	3	STOR	LEVER	Y	-	-	Y	Y(2)	Y	Y	Y	-	Y	-	-	Provide new hardware (to 087000)	-	-	-	Y	Y	Provide all rough-in & wiring for CR function
109a	Kitchen	to Corridor	-	-	-	GWB	PT	New paint (to 099000)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
109b	Kitchen	to Corridor	-	-	-	GWB	PT	New paint (to 099000)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
110b	Service Room	to Dishwash	-	-	Fx1	Ex. HM	PT	Ex. steel frame to remain to be made good, new paint finish (to 099000)	1	3'-0" x 7'-0" j.c.	LHR	Dx1	Ex. HM	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	Ex.	STOR	LEVER	-	-	-	-	-	-	-	-	-	-	-	-	Provide new hardware (to 087000), except where indicated as Ex., to be made good	-	-	-	Y	-	Provide all rough-in & wiring for CR function
111a	Servery	to Corridor	-	-	-	GWB	PT	New paint (to 099000)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
111b	Servery	to Dining	-	-	Ex.	ALUM	PRE	Ex. roll up grille frame to remain. Refurbish	1	As exist.	N/A	Ex.	ALUM	PRE	PRE	Ex. roll up grille frame to remain. Refurbish	-	STOR	CYLINDER	-	-	-	-	-	-	-	-	-	-	-	Provide new cylinder key to Owner's keying system (to 087000)	-	-	-	-	-	-	
111c	Servery	to Servery	-	-	Fx1	Ex. ALUM	PRE	Ex. opening to remain	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
112a	Support	to Dining	1.0 HR	45 MIN	Fx2	Ex. HM	PT	Ex. steel frame to remain to be m. g., new CCG (to 088000) new paint (to 099000)	1	3'-0" x 7'-0" j.c.	RH	Dx5	Ex. HM	PT	PT	Ex. door to remain, to be made good, provide new paint finish (to 099000)	3S	STOR	LEVER	-	-	WALL	-	-	-	-	-	-	-	-	-	Provide new hardware (to 087000)	Y	-	-	Y	-	Provide all rough-in & wiring for CR function
112b	Dining	to Corridor	-	-	Fx1	Ex. HM	PT	Ex. steel frame to remain to be made good, new paint finish (to 099000)	1	3'-0" x 7'-0" j.c.	RH	Dx1	Ex. HM	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	3S	STOR	LEVER	-	-	WALL	-	-	-	-	-	-	-	-	-	Provide new hardware (to 087000)	-	-	-	Ex.	Ex.	Ex. card reader and mag-lock to remain
118	Corridor	to Stair 1	1.0 HR	45 MIN	F1	HM SUW	PT	New steel frame (to 081113), to suit ex. masonry r.o. painted (to 099000)	1	3'-0" x 7'-0" j.c.	RH	D2	HM	PT	PT	New door (to 081113 & 088000), painted (to 099000)	3S	STOR (stair side)	LEVER c/w escutcheon	-	-	O/H	-	-	-	-	-	-	-	-	-	Provide new hardware (to 087000)	-	-	-	Y	Y(2)	New card reader to operate mag-lock, FA to release mag-lock
123a	Support	to BF WC	1.0 HR	45 MIN	Fx1	Ex. HM	PT	Ex. steel frame to remain to be made good, new paint finish (to 099000)	1	3'-0" x 7'-0" j.c.	RHR	Dx1	Ex. HM	PT	PT	Ex. door to remain, to be made good, provide new paint finish (to 099000)	3S	KEYED PRI	LEVER	-	-	-	-	-	-	-	-	-	-	-	-	Provide new hardware (to 087000), c/w emergency call assist system	Y	-	-	-	-	-
123b	BF WC	to Service Room	-	-	Fx1	Ex. HM	PT	Ex. steel frame to remain to be made good, new paint finish (to 099000)	1	3'-0" x 7'-0" j.c.	LHR	Dx1	Ex. HM	PT	PT	Ex. door to remain, to be made good, provide new paint finish (to 099000)	Ex.	STOR	LEVER	-																		



# Openings Schedule

No.	Room	Room	Rating	Frame (to 081113)			Door/Screen (to 081113 & 088000)				Hardware (see 087000)														Building Systems - External Connections													
				Assembly	Opening	Type	Material	Finish	Leaf	Nominal Size	Handing	Type	Material	Inner Finish	Outer Finish	Door Remarks	Hinge	Function	Trim	ED	Bolt	Stop	CLSR	KP	TH	WS	SWP	ADO & PB's	ES	Acoustic Seal	PTL	Hardware Remarks	Power	Fire Alarm System	Access Controls	Systems Remarks		
901-3	Exterior (Roof)	to Stair 1	1.0 HR	45 MIN	F1	IHM SUJW	PT	New insulated steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	3'-0" x 7'-0" j.c.	RH	D2	IHM	PT	PT	New door (to 081113 & 088000), painted (to 099000)	3S	STOR	LEVER	Y	-	WALL	-	Y(2)	Y	Y	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	Y	Y(2)	Y	Connect MAG to Fire Alarm. Provide all rough-in & wiring for CR function (interior side)
904-3	Corridor	to Stair 4	1.0 HR	45 MIN	Fx1	Ex.	PT	Ex. frame to remain, provide new paint finish (to 099000)	1	3'-0" x 7'-0" j.c.	RH	Dx3	Ex. HM	PT	PT	Ex. door to remain, to be made good, new glass (to 088000), new paint finish (to 099000)	3S	STOR	LEVER	Y	-	WALL	-	Y(2)	-	-	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	Y	-	-	Connect MAG to Fire Alarm
905-3	Corridor	to Stair 5	1.0 HR	45 MIN	Fx1	Ex. HM	PT	Ex. frame to remain, provide new paint finish (to 099000)	1	3'-0" x 7'-0" j.c.	LH	Dx5	Ex. HM	PT	PT	Ex. door to remain, provide new paint finish (to 099000)	3S	PASS	LEVER	Y	-	-	Remove Ex.	Y(2)	-	-	-	-	-	-	Provide new hardware (to 087000)	-	-	-	-	-	-	
301a	Corridor	to Room	1.0 HR	45 MIN	F1	HM KD	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	2'-8" x 7'-0" j.c.	RH	D1	HM	PT	PT	New door (to 081113), painted (to 099000)	3S	STOR	LEVER	-	-	WALL	-	Y(2)	-	-	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	-	Y	-	Provide all rough-in & wiring for CR function
301b	Room	to WC	-	-	Fx1	Ex. HM	PT	Ex. frame to remain to be made good, new paint finish (to 099000)	1	2'-8" x 6'-8" j.c.	LH	D1	HM	PT	PT	New door (to 081113), painted (to 099000)	3	PRI	LEVER	-	-	WALL	-	Y(2)	-	-	-	-	-	-	Provide new hardware (to 087000)	-	-	-	-	-	-	
302a	Corridor	to Room	1.0 HR	45 MIN	F1	HM KD	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	2'-8" x 7'-0" j.c.	LH	D1	HM	PT	PT	New door (to 081113), painted (to 099000)	3S	STOR	LEVER	-	-	WALL	-	Y(2)	-	-	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	-	Y	-	Provide all rough-in & wiring for CR function
302b	Room	to WC	-	-	Fx1	Ex. HM	PT	Ex. frame to remain to be made good, new paint finish (to 099000)	1	2'-8" x 6'-8" j.c.	RH	D1	HM	PT	PT	New door (to 081113), painted (to 099000)	3	PRI	LEVER	-	-	WALL	-	Y(2)	-	-	-	-	-	-	Provide new hardware (to 087000)	-	-	-	-	-	-	
305	Corridor	to Electrical Room	1.0 HR	45 MIN	F1	HM KD	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	3'-0" x 7'-0" j.c.	RH	D1	HM	PT	PT	New door (to 081113), painted (to 099000)	3	STOR	LEVER	-	-	WALL	Y	Y(2)	-	Y	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	-	Y	-	Provide all rough-in & wiring for CR function
307	Corridor	to Laundry	1.0 HR	45 MIN	F1	HM KD	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	3'-6" x 7'-0" j.c.	LH	D2	HM	PT	PT	New door (to 081113 & 088000), painted (to 099000)	3S	STOR	LEVER	-	-	WALL	-	Y(2)	-	-	-	Y	-	-	Provide new hardware (to 087000)	Y	-	-	Y	-	Provide all rough-in & wiring for CR function	
309	Janitor	to Corridor	1.0 HR	45 MIN	F1	HM KD	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	2'-6" x 7'-0" j.c.	LHR	D1	HM	PT	PT	New door (to 081113), painted (to 099000)	3	STOR	LEVER	-	-	-	Y	Y(2)	-	Y	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	-	Y	-	Provide all rough-in & wiring for CR function
311a	Corridor	to Room	1.0 HR	45 MIN	F1	HM KD	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	2'-8" x 7'-0" j.c.	LH	D1	HM	PT	PT	New door (to 081113), painted (to 099000)	3S	STOR	LEVER	-	-	WALL	-	Y(2)	-	-	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	-	Y	-	Provide all rough-in & wiring for CR function
311b	Room	to WC	-	-	Fx1	Ex. HM	PT	Ex. frame to remain to be made good, new paint finish (to 099000)	1	2'-8" x 6'-8" j.c.	RH	D1	HM	PT	PT	New door (to 081113), painted (to 099000)	3	PRI	LEVER	-	-	WALL	-	Y(2)	-	-	-	-	-	-	Provide new hardware (to 087000)	-	-	-	-	-	-	
312a	Corridor	to Room	1.0 HR	45 MIN	F1	HM KD	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	3'-2" x 7'-0" j.c.	RH	D1	HM	PT	PT	New door (to 081113), painted (to 099000)	3S	STOR	LEVER	-	-	WALL	-	Y(2)	-	-	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	-	Y	-	Provide all rough-in & wiring for CR function
312b	Room	to WC	-	-	F1	HM KD	PT	Ex. frame to remain to be made good, new paint finish (to 099000)	1	3'-2" x 7'-0" j.c.	LH	D1	HM	PT	PT	New door (to 081113), painted (to 099000)	3	PRI	LEVER	-	-	WALL	-	Y(2)	-	-	-	-	-	-	Provide new hardware (to 087000)	-	-	-	-	-	-	
315a	Corridor	to Room	1.0 HR	45 MIN	F1	HM KD	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	2'-8" x 7'-0" j.c.	LH	D1	Ex. HM	PT	PT	New door (to 081113), painted (to 099000)	3S	STOR	LEVER	-	-	WALL	-	Y(2)	-	-	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	-	Y	-	Provide all rough-in & wiring for CR function
315b	Room	to WC	-	-	Fx1	Ex. HM	PT	Ex. frame to remain to be made good, new paint finish (to 099000)	1	2'-8" x 6'-8" j.c.	RH	D1	HM	PT	PT	New door (to 081113), painted (to 099000)	3	PRI	LEVER	-	-	WALL	-	Y(2)	-	-	-	-	-	-	Provide new hardware (to 087000)	-	-	-	-	-	-	
316	Corridor	to Exterior (Roof)	-	-	F1	IHM SUJW	PT	New insulated steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	3'-0" x 7'-0" j.c.	RH	D3	IHM	PT	PT	New door (to 081113 & 088000), painted (to 099000)	3S	STOR	LEVER	Y	-	-	-	Y(2)	Y	Y	Y	-	Y	-	-	Provide new hardware (to 087000)	-	-	Y	Y(2)	Y	Connect MAG to Fire Alarm. Provide all rough-in & wiring for CR function (interior side)
320	Corridor	to Support	1.0 HR	45 MIN	F1	HM KD	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	2'-8" x 7'-0" j.c.	LH	D1	HM	PT	PT	New door (to 081113), painted (to 099000)	3S	STOR	LEVER	Y	-	WALL	-	Y(2)	-	-	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	-	Y	-	Provide all rough-in & wiring for CR function
321a	Corridor	to Room	1.0 HR	45 MIN	F1	HM KD	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	2'-8" x 7'-0" j.c.	RH	D1	HM	PT	PT	New door (to 081113), painted (to 099000)	3S	STOR	LEVER	-	-	WALL	-	Y(2)	-	-	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	-	Y	-	Provide all rough-in & wiring for CR function
321b	Room	to WC	-	-	Fx1	Ex. HM	PT	Ex. steel frame to remain to be made good, new paint finish (to 099000)	1	2'-8" x 7'-0" j.c.	RH	D1	HM	PT	PT	New door (to 081113), painted (to 099000)	3	PASS	LEVER	-	-	-	-	Y(2)	-	-	-	-	-	-	Provide new hardware (to 087000)	-	-	-	-	-	-	
322	Corridor	to Shower Room	1.0 HR	45 MIN	Fx1	Ex. HM	PT	Ex. steel frame to remain to be made good, new paint finish (to 099000)	1	2'-8" x 7'-0" j.c.	RH	Dx1	Ex. WD	PT	PT	Ex. door to remain, to be made good, provide new paint finish (to 099000)	3S	PASS	LEVER	-	-	-	-	Y(2)	-	-	-	-	-	-	Provide new hardware (to 087000)	-	-	-	-	-	-	
323	Corridor	to Room	1.0 HR	45 MIN	F1	HM KD	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	2'-8" x 7'-0" j.c.	RH	D1	HM	PT	PT	New door (to 081113), painted (to 099000)	3S	STOR	LEVER	-	-	WALL	-	Y(2)	-	-	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	-	Y	-	Provide all rough-in & wiring for CR function
324	Corridor	to Room	1.0 HR	45 MIN	F1	HM KD	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	2'-8" x 7'-0" j.c.	RH	D1	HM	PT	PT	New door (to 081113), painted (to 099000)	3S	STOR	LEVER	-	-	WALL	-	Y(2)	-	-	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	-	Y	-	Provide all rough-in & wiring for CR function
325	Corridor	to Room	1.0 HR	45 MIN	F1	HM KD	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	2'-8" x 7'-0" j.c.	LH	D1	HM	PT	PT	New door (to 081113), painted (to 099000)	3S	STOR	LEVER	-	-	WALL	-	Y(2)	-	-	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	-	Y	-	Provide all rough-in & wiring for CR function
326	Corridor	to Room	1.0 HR	45 MIN	F1	HM KD	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	2'-8" x 7'-0" j.c.	RH	D1	HM	PT	PT	New door (to 081113), painted (to 099000)	3S	STOR	LEVER	-	-	WALL	-	Y(2)	-	-	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	-	Y	-	Provide all rough-in & wiring for CR function
327	Corridor	to Room	1.0 HR	45 MIN	F1	HM KD	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	2'-8" x 7'-0" j.c.	LH	D1	HM	PT	PT	New door (to 081113), painted (to 099000)	3S	STOR	LEVER	-	-	WALL	-	Y(2)	-	-	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	-	Y	-	Provide all rough-in & wiring for CR function
328	Corridor	to Room	1.0 HR	45 MIN	F1	HM KD	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	2'-8" x 7'-0" j.c.	RH	D1	HM	PT	PT	New door (to 081113), painted (to 099000)	3S	STOR	LEVER	-	-	WALL	-	Y(2)	-	-	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	-	Y	-	Provide all rough-in & wiring for CR function
330	Corridor	to Room	1.0 HR	45 MIN	F1	HM KD	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	2'-8" x 7'-0" j.c.	LH	D1	HM	PT	PT	New door (to 081113), painted (to 099000)	3S	STOR	LEVER	-	-	WALL	-	Y(2)	-	-	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	-	Y	-	Provide all rough-in & wiring for CR function
331	Corridor	to Room	1.0 HR	45 MIN	F1	HM KD	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	2'-8" x 7'-0" j.c.	RH	D1	HM	PT	PT	New door (to 081113), painted (to 099000)	3S	STOR	LEVER	-	-	WALL	-	Y(2)	-	-	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	-	Y	-	Provide all rough-in & wiring for CR function
332	Corridor	to Room	1.0 HR	45 MIN	F1	HM KD	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	2'-8" x 7'-0" j.c.	LH	D1	HM	PT	PT	New door (to 081113), painted (to 099000)	3S	STOR	LEVER	-	-	WALL	-	Y(2)	-	-	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	-	Y	-	Provide all rough-in & wiring for CR function
333	Corridor	to Room	1.0 HR	45 MIN	F1	HM KD	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	2'-8" x 7'-0" j.c.	RH	D1	HM	PT	PT	New door (to 081113), painted (to 099000)	3S	STOR	LEVER	-	-	WALL	-	Y(2)	-	-	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	-	Y	-	Provide all rough-in & wiring for CR function
334a	Corridor	to Room	1.0 HR	45 MIN	F1	HM KD	PT	New steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	3'-0" x 7'-0" j.c.	LH	D1	HM	PT	PT	New door (to 081113), painted (to 099000)	3S	STOR	LEVER	-	-	WALL	-	Y(2)	-	-	-	-	Y	-	-	Provide new hardware (to 087000)	-	-	-	Y	-	Provide all rough-in & wiring for CR function
334b	Staff	to Exterior (Roof)	-	-	F1	IHM	PT	New insulated steel frame (to 081113), painted (to 099000), J.C. ex. r.o.	1	2'-10" x 7'-0" j.c.	LH	D1	IHM	PT	PT	New door (to 081113), painted (to 099000)	3	STOR	LEVER	-	-	-	Y	Y(2)	Y	Y	Y	-	Y	-	-	Provide new hardware (to 087000)	-	-	-	Y	Y	Provide all rough-in & wiring for CR. Locate CR on interior side to limit access to roof
335	Corridor	to WC	1.0 HR	45 MIN	F1																																	

**Room Finishes Schedule**

No.	Room Name	Flooring			Base			North Wall		East Wall		South Wall		West Wall		Wall Remarks	Ceilings			Bulkheads				
		Substrate	Floor	Floor Remarks	Substrate	Base	Base Remarks	Sub	Finish	Sub	Finish	Sub	Finish	Sub	Finish		Material	Finish	Height (a.f.f.)	Ceiling Remarks	Materials	Finish	Height (a.f.f.)	Bulkhead Remarks
<b>Stairs</b>																								
901	Stair 1	CONC	RS (RSL, RSR, RST)	New floor finish (to 096500)	CMU	Steel Stringer	Ex. stringer to remain, paint (to 099000)	CMU	PT	CMU	PT	CMU	PT	CMU	PT	New paint finishes (to 099000)	LAP/GWB	PRE/PT	varies	New LAP (to 095100)/New paint finishes (to 099000)	-	-	-	
902	Stair 2	CONC	RS (RSL, RSR, RST)	New floor finish (to 096500)	GWB	RBC / Steel Stringer	New Base (to 096500) / Ex. stringer to remain, paint (to 099000)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-6"	New paint finishes (to 099000)	-	-	-	
903	Stair 3	CONC	RS (RSL, RSR, RST)	New floor finish (to 096500)	CMU / GWB	RBC / Steel Stringer	New Base (to 096500) / Ex. stringer to remain, paint (to 099000)	CMU / GWB	PT	CMU / GWB	PT	CMU / GWB	PT	CMU / GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-6"	New paint finishes (to 099000)	-	-	-	
904	Stair 4	CONC	RS (RSL, RSR, RST)	New floor finish (to 096500)	GWB	RBC / Steel Stringer	New Base (to 096500) / Ex. stringer to remain, paint (to 099000)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	LAP/GWB	PRE/PT	varies	New LAP (to 095100)/New paint finishes (to 099000)	-	-	-	
905	Stair 5	CONC	RS (RSL, RSR, RST)	New floor finish (to 096500)	CMU / GWB	Wood	Existing to remain, paint (to 099000)	CMU	PT	CMU	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	varies	New paint finishes (to 099000)	-	-	-	
<b>Basement</b>																								
B01	Meeting Room 1	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	CMU	PT	CMU	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	-	-	-	
B02a	Bedroom	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	CMU / GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	-	-	-	
B02b	Kitchen/Living	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	GWB	PT	7'-4"	New paint finishes (to 099000)
B02c	Bath	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	CMU / GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	7'-6"	New paint finishes (to 099000)	-	-	-	
B03a	Storage	CONC	EPOXY	Seal Concrete (Div. 3 & 099000)	CMU	EPOXY	New integral Base (to 099000)	CMU	PT	CMU	PT	CMU	PT	CMU	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	-	-	-	
B03b	Ex. Lift Equip.	CONC	EPOXY	Seal Concrete (Div. 3 & 099000)	CMU	EPOXY	New integral Base (to 099000)	CMU	PT	CMU	PT	CMU	PT	CMU	PT	New paint finishes (to 099000)	GWB	PT	8'-0" j.c.	New paint finishes (to 099000)	-	-	-	
B03c	Service Entry	CONC	SV	New floor finish (to 096500)	CMU	SVC	New Base (to 096500)	CMU	PT	CMU	PT	CMU	PT	CMU	PT	New paint finishes (to 099000)	GWB	PT	16'-0" j.c.	New paint finishes (to 099000)	-	-	-	
B04a	Bath	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	CMU	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	7'-6"	New paint finishes (to 099000)	-	-	-	
B04b	Kitchen/Living	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	GWB	PT	CMU / GWB	PT	CMU / GWB	PT	CMU / GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	GWB	PT	7'-4"	New paint finishes (to 099000)
B04c	Bedroom	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	CMU / GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	-	-	-	
B05a	Office	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	CMU	PT	GWB	PT	GWB	PT	CMU	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	GWB	PT	7'-6", 7'-2", 7'-0"	New paint finishes (to 099000)
B05b	Support	CONC	Ex.	Existing to remain.	CMU / GWB	Ex.	Existing to remain.	CMU	PT	CMU	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	GWB	PT	7'-6", 7'-2"	New paint finishes (to 099000)
B06b	Corridor	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	GWB	PT	CMU / GWB	PT	CMU / GWB	PT	GWB	PT	New paint finishes (to 099000)	LAP	PRE	7'-6"	New LAP (to 095100)	-	-	-	
B06	Corridor	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	CMU / GWB	PT	GWB	PT	CMU / GWB	PT	GWB	PT	New paint finishes (to 099000)	LAP	PRE	7'-6"	New LAP (to 095100)	GWB/LAP	PT/PRE	7'-2", 6'-8", 7'-2"	(New to 095100)/New paint finishes (to 099000)
B07	Meeting Room 2	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	GWB	PT	CMU	PT	CMU	PT	CMU	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	GWB	PT	7'-8", 7'-6", 7'-0"	New paint finishes (to 099000)
B08a	Meeting Room 3	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	CMU / GWB	PT	CMU	PT	CMU	PT	CMU	PT	New paint finishes (to 099000)	GWB	PT	7'-4"	New paint finishes (to 099000)	GWB	PT	7'-2"	New paint finishes (to 099000)
B09b	Closet	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	CMU	PT	CMU	PT	GWB	PT	CMU	PT	New paint finishes (to 099000)	GWB	PT	?	New paint finishes (to 099000)	-	-	-	
B10a	Mechanical Room	CONC	EPOXY	Seal Concrete (Div. 3 & 099000)	CMU / GWB	EPOXY	New integral Base (to 099000)	GWB	PT	CMU / GWB	PT	CMU	PT	CMU	PT	New paint finishes (to 099000)	GWB	PT	7'-6"	New paint finishes (to 099000)	-	-	-	
B10b	Elevator Room	CONC	EPOXY	Seal Concrete (Div. 3 & 099000)	CMU / GWB	EPOXY	New integral Base (to 099000)	CMU	PT	CMU	PT	CMU	PT	CMU	PT	New paint finishes (to 099000)	GWB	PT	7'-0"	New paint finishes (to 099000)	-	-	-	
B12	Staff	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	CMU / GWB	PT	GWB	PT	GWB	PT	CMU	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	GWB	PT	7'-6", 7'-4", 7'-2"	New paint finishes (to 099000)
B13	Staff BF WC	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	GWB	PT	7'-4"	New paint finishes (to 099000)
B14	Office	CONC	Ex.	Existing to remain.	CMU / GWB	Ex.	Existing to remain.	CMU / GWB	PT	CMU	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	7'-4", 7'-2"	New paint finishes (to 099000)	GWB	PT	7'-4", 7'-2"	New paint finishes (to 099000)
B15	Staff WC	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	GWB	PT	7'-6", 7'-0"	New paint finishes (to 099000)
B16	Staff WC	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	LAP	PRE	7'-2"	New LAP (to 095100)	-	-	-	
B20	Office	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	CMU	PT	CMU	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	GWB	PT	7'-2", 7'-0"	New paint finishes (to 099000)
B21	Elev. Sump Room	CONC	EPOXY	Seal Concrete (Div. 3 & 099000)	CMU / GWB	EPOXY	New integral Base (to 099000)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	7'-2"	New paint finishes (to 099000)	-	-	-	
B22	Unoccupied	CONC	EPOXY	Seal Concrete (Div. 3 & 099000)	CMU / GWB	EPOXY	New integral Base (to 099000)	GWB	PT	CMU	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	varies	New paint finishes (to 099000)	GWB	PT	varies	New paint finishes (to 099000)
B23	Office	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	7'-6"	New paint finishes (to 099000)	GWB	PT	7'-0"	New paint finishes (to 099000)
B24N	Corridor	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	CMU	PT	CMU / GWB	PT	-	-	CMU / GWB	PT	New paint finishes (to 099000)	GWB	PT	7'-2"	New paint finishes (to 099000)	GWB	PT	6'-8"	New paint finishes (to 099000)
B24S	Corridor	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	CMU	PT	GWB	PT	CMU / GWB	PT	CMU / GWB	PT	New paint finishes (to 099000)	GWB	PT	7'-0"	New paint finishes (to 099000)	GWB	PT	6'-8"	New paint finishes (to 099000)
B25	Open Staff	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	CMU / GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	7'-8"	New paint finishes (to 099000)	GWB	PT	7'-2", 6'-8"	New paint finishes (to 099000)
B26	Office	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	LAP	PRE	8'-0"	New LAP (to 095100)	-	-	-	
B27	Mechanical Room	CONC	EPOXY	Seal Concrete (Div. 3 & 099000)	CMU / GWB	EPOXY	New integral Base (to 099000)	CMU	PT	CMU	PT	CMU	PT	GWB	PT	New paint finishes (to 099000)	GWB/EXP	PT	9'-6"	New paint finishes (to 099000)	EXP	-	8'-6"	-
B28a	Electrical Room	CONC	EPOXY	Seal Concrete (Div. 3 & 099000)	CMU / GWB	EPOXY	New integral Base (to 099000)	CMU	PT	CMU	PT	CMU	PT	GWB	PT	New paint finishes (to 099000)	GWB/EXP	PT	10'-6"	New paint finishes (to 099000)	EXP	-	8'-6"	-
B29	Outreach BF WC	CONC	SV & Ex. Tile	New floor finish (to 096500), existing tile to remain	CMU / GWB	SVC	New Base (to 096500)	CMU / GWB	PT	GWB	PT	GWB	PT	CMU / GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	GWB	PT	7'-4"	New paint finishes (to 099000)
B30	Nurse	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	CMU	PT	CMU / GWB	PT	New paint finishes (to 099000)	LAP	PRE	8'-0"	New LAP (to 095100)	-	-	-	
B31a	WC	CONC	SV	New floor finish (to 096500)	CMU / GWB	SVC	New Base (to 096500)	GWB	PT	CMU / GWB	PT	CMU	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-6"	New paint finishes (to 099000)	GWB	PT	7'-4"	New paint finishes (to 099000)
B31b	Kitchen	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	GWB	PT	-	-	CMU	PT	CMU / GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-6"	New paint finishes (to 099000)	GWB	PT	7'-4"	New paint finishes (to 099000)
B31c	Living	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	CMU	PT	New paint finishes (to 099000)	GWB	PT	8'-6"	New paint finishes (to 099000)	-	-	-	
B31d	Bedroom	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-6"	New paint finishes (to 099000)	-	-	-	
B32	Corridor	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	CMU	PT	CMU / GWB	PT	CMU	PT	CMU	PT	New paint finishes (to 099000)	LAP	PRE	9'-6"/8'-6"	New LAP (to 095100)	GWB/LAP	PT/PRE	8'-6"	(New to 095100)/New paint finishes (to 099000)
B33a	Maintenance Office	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	CMU	PT	CMU	PT	CMU	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	9'-6"	New paint finishes (to 099000)	GWB	PT	8'-6"	New paint finishes (to 099000)
B33b	Maintenance Storage	CONC	SEAL	Seal Concrete (Div. 3 & 099000)	CMU / GWB	-	-	CMU	PT	GWB	PT	CMU	PT	CMU	PT	New paint finishes (to 099000)	GWB	PT	9'-6"	New paint finishes (to 099000)	GWB	PT	8'-6"	New paint finishes (to 099000)
B34	Storage	CONC	EPOXY	Seal Concrete (Div. 3 & 099000)	CMU / GWB	EPOXY	New integral Base (to 099000)	GWB	PT	GWB	PT	CMU	PT	CMU	PT	New paint finishes (to 099000)	GWB	PT	9'-6"	New paint finishes (to 099000)	-	-	-	
B35	Storage	CONC	SEAL	Seal Concrete (Div. 3 & 099000)	CMU	-	-	CMU	PT	CMU	PT	CMU	PT	CMU	PT	New								

**Room Finishes Schedule**

Room No.	Room Name	Flooring						North Wall		East Wall		South Wall		West Wall		Ceilings				Bulkheads				
		Substrate	Floor	Floor Remarks	Substrate	Base	Base Remarks	Sub	Finish	Sub	Finish	Sub	Finish	Sub	Finish	Wall Remarks	Material	Finish	Height (a.f.f.)	Ceiling Remarks	Materials	Finish	Height (a.f.f.)	Bulkhead Remarks
<b>Ground Floor</b>																								
101a	Program Room	CONC	SV	New floor finish (to 096500)	CMU / GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	CMU	PT	GWB	PT	New paint finishes (to 099000)	LAP	PRE	8'-0"	New LAP (to 095100)	GWB	PT	7'-4"	New paint finishes (to 099000)
101b	Janitor	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	-	-	-	-
101c	Electrical Room	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	-	-	-	-
101d	Storage	CONC	SV	New floor finish (to 096500)	CMU / GWB	SVC	New Base (to 096500)	GWB	PT	CMU	PT	CMU	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-6"	New paint finishes (to 099000)	-	-	-	-
102a	Kitchen/Living/Dining	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-6"	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)
102b	Sleeping	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-6"	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)
102c	WC	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	-	-	-	-
103	Staff	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	LAP	PRE	8'-0"	New LAP (to 095100)	-	-	-	-
103a	Staff WC	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	-	-	-	-
104a	Kitchen/Living/Dining	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	GWB	PT	CMU / GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-6"	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)
104b	Sleeping	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-6"	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)
104c	WC	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	-	-	-	-
108	Food Storage	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	LAP	PRE	8'-0"	New LAP (to 095100)	-	-	-	-
110	Dishwash	CONC	CT	Existing to remain	GWB	CT	Existing to remain	GWB	CT	GWB	CT	GWB	CT	GWB	CT	Existing Tile to remain	LAP	PRE	8'-6"	New LAP (to 095100)	-	-	-	-
110b	Service Room	CONC	CT	Existing to remain	GWB	CT	Existing to remain	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	-	-	-	-
109	Kitchen	CONC	CT	Existing to remain	GWB	CT	Existing to remain	GWB	CT	GWB	CT	GWB	CT	GWB	CT	Existing Tile to remain / New paint finishes (to 099000)	LAP	PRE	8'-0"	New LAP (to 095100)	GWB	PT	7'-6"	New paint finishes (to 099000)
111	Servery	CONC	CT	Existing to remain	GWB	CT	Existing to remain	GWB	PT	GWB	PT	GWB	PT	GWB	CT	Existing Tile to remain / New paint finishes (to 099000)	LAP	PRE	8'-6"	New LAP (to 095100)	-	-	-	-
112	Dining	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	GWB	PT	CMU / GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	LAP	PRE	8'-6"	New LAP (to 095100)	GWB	PT	8'-6"	New paint finishes (to 099000)
118a	Corridor	CONC	SV	New floor finish (to 096500)	CMU / GWB	SVC	New Base (to 096500)	GWB	PT	CMU	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	LAP	PRE	8'-0"	New LAP (to 095100)	-	-	-	-
118b	Corridor	CONC	SV	New floor finish (to 096500)	CMU / GWB	SVC	New Base (to 096500)	-	-	CMU / GWB	PT	CMU	PT	GWB	PT	New paint finishes (to 099000)	LAP	PRE	8'-0"	New LAP (to 095100)	-	-	-	-
120	Corridor	CONC	PCT	Existing to remain	GWB	PCT	Existing to remain	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	LAP	PRE	8'-6"	New LAP (to 095100)	-	-	-	-
122	Support	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	CMU / GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	LAP	PRE	8'-6"	New LAP (to 095100)	-	-	-	-
123a	BF WC	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	-	-	-	-
123b	Service Room	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	-	-	-	-
124	Entry	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	-	-	CMU / GWB	PT	New paint finishes (to 099000)	LAP	PRE	8'-6"	New LAP (to 095100)	-	-	-	-
125a	Office	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	LAP	PRE	8'-6"	New LAP (to 095100)	-	-	-	-
125b	Reception	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	LAP	PRE	8'-6"	New LAP (to 095100)	-	-	-	-
126	Vestibule	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	CMU	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	7'-2"	New paint finishes (to 099000)	-	-	-	-
127	Storage	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	CMU	PT	GWB	PT	GWB	PT	CMU	PT	New paint finishes (to 099000)	GWB	PT	7'-2"	New paint finishes (to 099000)	-	-	-	-

**Legend of Related Finish Abbreviations:**

A.F.F.	-	above finished floor
ALUM	-	aluminium
CB	-	concrete block
CLG	-	ceiling
CMU	-	concrete masonry unit
CONC	-	concrete
CPT	-	carpet
CPTT	-	carpet tile
CT	-	ceramic tile
EXP	-	exposed structure
F or FL	-	floor
FRR	-	fire resistance rating
FS	-	fire separation glass
GL	-	gypsum wall board
GWB	-	hardwood
HWD	-	hardwood
LAM	-	laminate
LAP	-	lay-in panel or lay-in acoustic tile
LINO	-	linoleum
L&P	-	lath and plaster
LVT	-	luxury vinyl tile
MLWK	-	millwork
MRT	-	marble tile
MT	-	mosaic tile
N/A	-	not applicable
NIC	-	not in contract
OWSJ	-	open-web steel joist
PCC	-	precast concrete
PCT	-	porcelain ceramic tile
PLAM	-	plastic laminate
PLY	-	plywood
PT	-	paint
QT	-	quarry tile
R	-	resilient flooring
RBC	-	rubber base cove
RSL	-	rubber stair landing tile
RSH	-	rubber stair riser
RST	-	rubber stair tread
RSV	-	resilient sheet vinyl
SEAL	-	sealed concrete
SV	-	sheet vinyl
TER	-	terrazzo
UFJ	-	unfinished
VBC	-	vinyl base cove
VCT	-	vinyl composite tile
VWC	-	vinyl wall covering

**General Notes to Room Finishes Schedule:**

For Ceilings and Bulkheads see also Reflected Ceilings Plans.  
 Contractor, Mechanical Trade Contractor and Electrical Trade Contractor shall provide all building systems component layout and interference drawings prior to layout of ceilings, to verify all heights will be achieved.

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No.	Issued for Purpose	Date	Initial
1	30% Check Set	Dec. 05 '24	MM
2	90% Check Set	Dec. 12 '24	MM
T	For Tender	Dec. 19 '24	MM

**General Notes:**

For Cover and General Notes see Sheet A001  
 For OBC Matrix and Information see Sheet A011  
 For WC Accessories OBC Requirements see Sheet A012  
 For Assembly Types see Sheet A021  
 For Sequence of Construction see Sheet A031  
 For Site Plan see Sheet A121  
 For Floor Plan Removals see A200 series Sheets  
 For Floor Plans see A210 series Sheets  
 For Roof Plan see Sheet A215  
 For Roof Assembly Types see Sheet A215  
 For Floor Finishes Plans see A230 series Sheets  
 For Building Elevations see A300 series Sheets  
 For Window Schedules see Sheet A311  
 For Window Coverings Schedule see Sheet A321  
 For Reflected Ceiling Plans see A500 series Sheets  
 For Ceiling Assembly Types see Sheet A501  
 For Wall Sections see A600 series Sheets  
 For Stair Plans, & Sections see A700 series Sheets  
 For Millwork see A710 series Sheets  
 For Openings Schedules see A900 series Sheets  
 For Room Finishes Schedules see A910 series Sheets  
 For Owner Equipment Schedule see Sheet A921  
 For Mechanical Drawings see M series Sheets  
 For Electrical Drawings see E series Sheets

No.	Revision	Date	Initial

**Project**  
 RoW - 84 Frederick St.  
 Renovation & Renewal  
 84 Frederick St  
 Kitchener, ON

	Approved	AD
	Checked	MM
Drawing Title	Drawn	AJ

Ground Floor  
 Room Finishes Schedule

Scale (for 24x36" printing) Dwg. No.  
 as noted A912

**Room Finishes Schedule**

No.	Room Name	Flooring			Base			North Wall		East Wall		South Wall		West Wall		Ceilings			Bulkheads					
		Substrate	Floor	Floor Remarks	Substrate	Base	Base Remarks	Sub	Finish	Sub	Finish	Sub	Finish	Sub	Finish	Wall Remarks	Material	Finish	Height (a.f.f.)	Ceiling Remarks	Materials	Finish	Height (a.f.f.)	Bulkhead Remarks
<b>Second Floor</b>																								
201a	Room	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	-	-	-	-
201b	WC	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	7'-6"	New paint finishes (to 099000)	GWB	PT	TBC	Height co-ordinated with shower unit, New paint finishes (to 099000)
202a	Room	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	-	-	-	-
202b	WC	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	7'-6"	New paint finishes (to 099000)	GWB	PT	TBC	Height co-ordinated with shower unit, New paint finishes (to 099000)
205a	Room	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	GWB	PT	CMU	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	GWB	PT	7'-6"	New paint finishes (to 099000)
205b	WC	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	7'-6"	New paint finishes (to 099000)	GWB	PT	TBC	Height co-ordinated with shower unit, New paint finishes (to 099000)
206a	Room	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	GWB	PT	CMU	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	GWB	PT	7'-6"	New paint finishes (to 099000)
206b	WC	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	7'-6"	New paint finishes (to 099000)	GWB	PT	TBC	Height co-ordinated with shower unit, New paint finishes (to 099000)
211a	Room	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	CMU	PT	New paint finishes (to 099000)	GWB	PT	8'-6"	New paint finishes (to 099000)	GWB	PT	8'-0", 7'-8"	New paint finishes (to 099000)
211b	WC	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	GWB	PT	TBC	Height co-ordinated with shower unit, New paint finishes (to 099000)
212a	Room	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	CMU	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	GWB	PT	7'-6", 7'-0"	New paint finishes (to 099000)
212b	WC	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	GWB	PT	TBC	Height co-ordinated with shower unit, New paint finishes (to 099000)
215	Storage	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-6"	New paint finishes (to 099000)	-	-	-	-
216	Electrical Room	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-6"	New paint finishes (to 099000)	-	-	-	-
217	Lounge	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	-	-	-	-
218	Laundry	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	-	-	-	-
219	Corridor	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	-	-	GWB	PT	GWB	PT	New paint finishes (to 099000)	LAP	PRE	8'-0"	New LAP (to 095100)	LAP	PRE	7'-0"	(New to 095100)
220	Janitor	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	-	-	-	-
221a	Room	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-6"	New paint finishes (to 099000)	GWB	PT	8'-0", 7'-2"	New paint finishes (to 099000)
221b	WC	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-6"	New paint finishes (to 099000)	GWB	PT	TBC	Height co-ordinated with shower unit, New paint finishes (to 099000)
223a	Room	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	GWB	PT	CMU / GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-6"	New paint finishes (to 099000)	GWB	PT	7'-6"	New paint finishes (to 099000)
223b	WC	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	GWB	PT	TBC	Height co-ordinated with shower unit, New paint finishes (to 099000)
225a	Room	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-6"	New paint finishes (to 099000)	GWB	PT	7'-6"	New paint finishes (to 099000)
225b	WC	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	GWB	PT	TBC	Height co-ordinated with shower unit, New paint finishes (to 099000)
226	Elevator Lobby	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	CMU / GWB	PT	-	-	GWB	PT	-	-	New paint finishes (to 099000)	GWB	PT	7'-2"	New paint finishes (to 099000)	-	-	-	-
227	Corridor	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	CMU	PT	GWB	PT	-	-	GWB	PT	New paint finishes (to 099000)	GWB	PT	7'-2"	New paint finishes (to 099000)	-	-	-	-
229a	Room	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	7'-8", 8'-6"	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)
229b	WC	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	7'-6"	New paint finishes (to 099000)	GWB	PT	TBC	Height co-ordinated with shower unit, New paint finishes (to 099000)
230a	Room	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	CMU	PT	GWB	PT	CMU / GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-6"	New paint finishes (to 099000)	GWB	PT	8'-0", 7'-4", 7'-0"	New paint finishes (to 099000)
230b	WC	CONC	SV	New floor finish (to 096500)	CMU / GWB	SVC	New Base (to 096500)	CMU	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	7'-6"	New paint finishes (to 099000)	GWB	PT	TBC	Height co-ordinated with shower unit, New paint finishes (to 099000)
231a	Room	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	CMU	PT	GWB	PT	CMU	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	9'-6"	New paint finishes (to 099000)	GWB	PT	8'-6"	New paint finishes (to 099000)
231b	WC	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	9'-6", 7'-6"	New paint finishes (to 099000)	GWB	PT	TBC	Height co-ordinated with shower unit, New paint finishes (to 099000)
232	Corridor	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	GWB	PT	CMU / GWB	PT	-	-	CMU / GWB	PT	New paint finishes (to 099000)	GWB	PT	9'-6"	New paint finishes (to 099000)	GWB	PT	7'-2", 7'-0"	New paint finishes (to 099000)
233a	Room	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-6"	New paint finishes (to 099000)	GWB	PT	sloped	New paint finishes (to 099000)
233b	WC	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-6"	New paint finishes (to 099000)	GWB	PT	TBC	Height co-ordinated with shower unit, New paint finishes (to 099000)
234a	Support	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-6"	New paint finishes (to 099000)	GWB	PT	7'-0"	New paint finishes (to 099000)
234b	Support	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-6"	New paint finishes (to 099000)	GWB	PT	7'-0"	New paint finishes (to 099000)
235a	Room	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-6"	New paint finishes (to 099000)	-	-	-	-
235b	WC	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-6"	New paint finishes (to 099000)	GWB	PT	TBC	Height co-ordinated with shower unit, New paint finishes (to 099000)
236	Lounge	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	-	-	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	9'-6"	New paint finishes (to 099000)	GWB	PT	7'-6"	New paint finishes (to 099000)
237a	Room	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	9'-6"	New paint finishes (to 099000)	-	-	-	-
237b	WC	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-6"	New paint finishes (to 099000)	GWB	PT	TBC	Height co-ordinated with shower unit, New paint finishes (to 099000)

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A.F.F.	-	above finished floor
ALUM	-	aluminum
CB	-	concrete block
CLG	-	ceiling
CMU	-	concrete masonry unit
CONC	-	concrete
CPT	-	carpet
CPTT	-	carpet tile
CT	-	ceramic tile
EXP	-	exposed structure
F or FL	-	floor
FRR	-	fire resistance rating
FS	-	fire separation
GL	-	glass
GWB	-	gypsum wall board
LAM	-	laminate
HWD	-	hardwood
LAP	-	lay-in panel or lay-in acoustic tile
LINO	-	linoleum
LSP	-	lath and plaster
LVT	-	luxury vinyl tile
MLWK	-	milwork
MRT	-	marble tile
MT	-	mosaic tile
N/A	-	not applicable
NIC	-	not in contract
OWSJ	-	open-web steel joist
PCC	-	precast concrete
PCT	-	porcelain ceramic tile
PLAM	-	plastic laminate
PLY	-	plywood
PT	-	paint
QT	-	quarry tile
R	-	resilient flooring
RBC	-	rubber base cove
RSL	-	rubber stair landing tile
RSR	-	rubber stair riser
RST	-	rubber stair tread
RSV	-	resilient sheet vinyl
SEAL	-	sealed concrete
SV	-	sheet vinyl
TER	-	terrazzo
VJF	-	unfinished
VBC	-	vinyl base cove
VCT	-	vinyl composite tile
VWC	-	vinyl wall covering

**General Notes to Room Finishes Schedule:**

For Ceilings and Bulkheads see also Reflected Ceilings Plans.  
 Contractor, Mechanical Trade Contractor and Electrical Trade Contractor shall provide all building systems component layout and interference drawings prior to layout of ceilings, to verify all heights will be achieved.

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 For Electrical Drawings see E series Sheets

No.	Revision	Date	Initial
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**Project**  
 RoW - 84 Frederick St.  
 Renovation & Renewal  
 84 Frederick St

**Room Finishes Schedule**

Room No.	Room Name	Flooring						North Wall		East Wall		South Wall		West Wall		Ceilings				Bulkheads				
		Substrate	Floor	Floor Remarks	Substrate	Base	Base Remarks	Sub	Finish	Sub	Finish	Sub	Finish	Sub	Finish	Wall Remarks	Material	Finish	Height (a.f.f.)	Ceiling Remarks	Materials	Finish	Height (a.f.f.)	Bulkhead Remarks
<b>Third Floor</b>																								
301a	Room	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-8"	New paint finishes (to 099000)	-	-	-	-
301b	WC	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	GWB	PT	TBC	Height co-ordinated with shower unit, New paint finishes (to 099000)
302a	Room	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-8"	New paint finishes (to 099000)	GWB	PT	7'-4"	New paint finishes (to 099000)
302b	WC	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	GWB	PT	TBC	Height co-ordinated with shower unit, New paint finishes (to 099000)
305	Electrical Room	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-8"	New paint finishes (to 099000)	-	-	-	-
306	Lounge	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-8"	New paint finishes (to 099000)	-	-	-	-
307	Laundry	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-8"	New paint finishes (to 099000)	-	-	-	-
309	Janitor Room	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	-	-	-	-
311a	Room	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	GWB	PT	CMU	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-8"	New paint finishes (to 099000)	-	-	-	-
311b	WC	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	GWB	PT	TBC	Height co-ordinated with shower unit, New paint finishes (to 099000)
312a	Room	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	GWB	PT	7'-6"	New paint finishes (to 099000)
312b	WC	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	GWB	PT	TBC	Height co-ordinated with shower unit, New paint finishes (to 099000)
315a	Room	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-8"	New paint finishes (to 099000)	-	-	-	-
315b	WC	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	GWB	PT	TBC	Height co-ordinated with shower unit, New paint finishes (to 099000)
316	Corridor	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	CMU / GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	LAP	PRE	8'-0"	New LAP (to 095100)	-	-	-	-
320	Support	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-8"	New paint finishes (to 099000)	-	-	-	-
321a	Room	CONC	LVT	New floor finish (to 096500)	CMU / GWB	VBC	New Base (to 096500)	CMU	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-8"	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)
321b	WC	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	GWB	PT	TBC	Height co-ordinated with shower unit, New paint finishes (to 099000)
322	Shower Room	CONC	SV	New floor finish (to 096500)	GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	GWB	PT	7'-0"	New paint finishes (to 099000)
323	Room	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	-	-	-	-
324	Room	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	-	-	-	-
325	Room	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	-	-	-	-
326	Room	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	-	-	-	-
327	Room	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	-	-	-	-
328	Room	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	-	-	-	-
330	Room	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	-	-	-	-
331	Room	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	-	-	-	-
332	Room	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	-	-	-	-
333	Room	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	GWB	PT	7'-4"	New paint finishes (to 099000)
334	Staff	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	-	-	-	-
335	WC	CONC	SV	New floor finish (to 096500)	CMU / GWB	SVC	New Base (to 096500)	GWB	PT	GWB	PT	CMU	PT	GWB	PT	New paint finishes (to 099000)	GWB	PT	8'-0"	New paint finishes (to 099000)	GWB	PT	7'-6"	New paint finishes (to 099000)
336	Corridor	CONC	LVT	New floor finish (to 096500)	GWB	VBC	New Base (to 096500)	GWB	PT	GWB	PT	GWB	PT	GWB	PT	New paint finishes (to 099000)	LAP	PRE	8'-0"	New LAP (to 095100)	-	-	-	-
338	Mechanical Room	CONC	SEAL	Seal Concrete (Div. 3 & 099000)	CMU	VBC	New Base (to 096500)	GWB	PT	BRICK	-	GWB	PT	GWB	PT	New paint finishes (to 099000)	EXP	-	-	-	-	-	-	-

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FRR	-	fire resistance rating
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LAM	-	laminate
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LSP	-	lath and plaster
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SEAL	-	sealed concrete
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 For Room Finishes Schedules see A910 series Sheets  
 For Owner Equipment Schedule see Sheet A921  
 For Mechanical Drawings see M series Sheets  
 For Electrical Drawings see E series Sheets

No.	Revision	Date	Initial

**Project**  
 RoW - 84 Frederick St.  
 Renovation & Renewal  
 84 Frederick St  
 Kitchener, ON

Approved AD  
 Checked MM  
 Drawing Title Drawn AJ

Third Floor  
 Room Finishes Schedule

Scale (for 24x36" printing) Dwg. No.  
 as noted A914

Owner Equipment Schedule (to 110500):

General										Supports				Electrical (to Division 26)						Plumbing (to Divisions 20 & 22)						Gas (to Divisions 20 & 23)			
No.	Location(s)	Equip. Name/Model No.	Equipment Supply	Dimensions (mm)			Weight (kg)	Equipment Install	Req'd	Remarks	Voltage/Phase	Connection		Compressor		Loads		Electrical Remarks	Water Supply				Drain		Plumbing Remarks	Man.	MBTU	HVAC Remarks	
				W	D	H						Plug-in	Direct	Local	Remote	Amps	Watts (KW)		H.P.	CW	CS	HW (104°)	TW (120°)	Direct					Indirect
Ex.	Kitchen & Dishwash	Existing Foodservice Equipment to remain	by Owner, as exist.	varies	varies	varies	varies	by Contractor	Ex.	Make good	Ex.	j.c.	j.c.	j.c.	j.c.	j.c.	j.c.	As ex. Job Check. Make good to ensure function of all equipment having electrical connection	j.c.	j.c.	j.c.	j.c.	j.c.	j.c.	As ex. Job Check. Make good leaks.	j.c.	j.c.	(re)commission ex. Gas feeds	
1.1	All Apartments	Residential Refrigerators	by Owner	Max. 30"	Max. 28"	Max. 72"	-	by Owner	-	Floor	120V	Y	-	Y	-	20A max.	-	Ex. circuits to remain. Job check.	-	-	-	-	-	-	N/A	-	-	N/A	
1.2	All Apartments	Residential Ranges	by Owner	Max. 30"	Max. 25"	Max. 36"	-	by Owner	-	Floor	120V	Y	-	-	-	standard	-	Ex. circuits to remain. Job check.	-	-	-	-	-	-	N/A	-	-	N/A	
1.3	Food Storage	Reach-in Food Storage Coolers	by Owner	TBD	TBD	TBD	TBD	by Contractor	-	Floor	120/208	Y	-	Y	-	20A	-	New dedicated 20A circuits	-	-	-	-	-	Y	to Hub Drain	-	-	N/A	
1.4	Laundry Room	Huebsch Quantum Gold Commercial Front Control Front Load Washer - Canada	by Allowance	26 7/8"	27 3/4"	44 3/8"	118kg	by Owner Nominated Contractor	Y	Raised pedestal	120/60/1	Y	-	-	-	15A	-	0.9	New dedicated 20A circuits	-	Y	Y	-	-	Y	See Mechanical for wall boxes	-	-	N/A
1.5	Laundry Room	Huebsch Quantum Gold Commercial Front Control Single Dryer - Canada	by Allowance	26 7/8"	28"	44 3/8"	68kg	by Owner Nominated Contractor	Y	Raised pedestal	120/208	Y	-	-	-	30A	4250W	-	New dedicated 20A circuits	-	-	-	-	-	-	N/A	-	-	4"o exhaust connections, see also Mech. Docs.
1.6	Laundry Room	Washer & Dryer Pedestal Bases	by Allowance	to suit washer and dryer equipment				by Owner Nominated Contractor	-	Floor	-	-	-	-	-	-	-	-	N/A	-	-	-	-	-	-	-	-	-	N/A
1.7	Laundry Room	Huebsch Quantum Gold Commercial Stack Washer/Dryer - Canada	by Allowance	26 7/8"	27 3/4"	78 1/8"	175kg	by Owner Nominated Contractor	Y	Wall bracket against tipping	120/208	Y	-	-	-	40A	-	-	New dedicated 20A circuits	-	Y	Y	-	-	Y	See Mechanical for wall boxes	-	-	4"o exhaust connections, see also Mech. Docs.
1.8	Janitor's Room	Detergent Dispenser	by Allowance	TBD	TBD	TBD	TBD	by Owner Nominated Contractor	Y	blocking (to 061000)	120V	Y	-	-	-	-	-	-	New duplex receptacle	-	-	-	-	-	-	plastic tubing feeds to washers	-	-	N/A
1.9	Storage Room @ Main Entry	Shelving System	by Owner	TBD	TBD	TBD	TBD	by Owner	Y	blocking (to 061000)	-	-	-	-	-	-	-	-	N/A	-	-	-	-	-	-	-	-	N/A	
1.10	2 <sup>nd</sup> Fl. Storage Room	Storage Racking System	by Owner	TBD	TBD	TBD	TBD	by Owner	Y	Floor-mounted, secured to wall. Provide blocking (to 061000)	-	-	-	-	-	-	-	-	N/A	-	-	-	-	-	-	-	-	N/A	

General Notes to Owner Equipment Schedules:

Refer also to Division 02 requirements. Comply with requirements for the integration of the work described in this Section into its roles in the various systems. Provide the work so that the performance requirements of the overall system of which it forms part is achieved.

Obtain information for Owner Provided Equipment from Owner in due time to co-ordinate any rough-in requirements. Confirm height, location, and size of units with authorities having jurisdiction and the Owner. Do not rely upon drawings for final location of units.

Ensure work over equipment locations is complete, and no further access is required. Ensure floors are sealed and finished a minimum 24 hours prior to delivery and installation.

Cooperate with Owner's forces for installation of equipment control wiring, datacom equipment, security equipment, and communications and security lines and devices immediately following completion of areas for turn over to the Owner's use and enjoyment.

See also section 101400 for Supply of Interior Building Signage by Cash Allowance, for installation this Contract. Required interior building signs are not shown in Equipment Schedules.

See also section 102800 Washroom and Shower Accessories, for accessories supplied by the Owner by material supply cash allowance, for installation as Owner Supplied Equipment this Contract. Washroom and Shower Accessories are not shown in Equipment Schedules.

Refer also to Floor Plans, for Equipment tags.

Mechanical and Electrical Trade Contractors shall review Equipment Schedules and all new equipment cut sheets, and shall provide all connections to building systems. All such work is included in the Contract Price.

Electrical Trade Contractor shall test all existing equipment to ensure function and operation. Make good and replace direct connections and/or repair receptacles where damaged or non-functional. Report to Owner where equipment itself is found to be deficient.

Notes to Equipment Schedule:

- 1. Ensure controls and door height to AODA requirements.
- 2. Pedestal required for each front load washer unit and dryer unit. Provide all fasteners and plates for securement of units to pedestals to manufacturer's written instructions.
- 3. Coordinate routing of plastic dispensing piping from dispensers to washers. Provide sleeving through all rated assemblies and fire-stop (to 078400).

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T	For Tender	Dec. 19 '24	MM

General Notes:

For Cover and General Notes see Sheet A001  
 For OBC Matrix and Information see Sheet A011  
 For WC Accessories OBC Requirements see Sheet A012  
 For Assembly Types see Sheet A021  
 For Sequence of Construction see Sheet A031  
 For Site Plan see Sheet A121  
 For Floor Plan Removals see A200 series Sheets  
 For Floor Plans see A210 series Sheets  
 For Roof Plan see Sheet A215  
 For Roof Assembly Types see Sheet A215  
 For Floor Finishes Plans see A230 series Sheets  
 For Building Elevations see A300 series Sheets  
 For Window Schedules see Sheet A311  
 For Window Coverings Schedule see Sheet A321  
 For Reflected Ceiling Plans see A500 series Sheets  
 For Ceiling Assembly Types see Sheet A501  
 For Wall Sections see A600 series Sheets  
 For Stair Plans, & Sections see A700 series Sheets  
 For Millwork see A710 series Sheets  
 For Openings Schedules see A900 series Sheets  
 For Room Finishes Schedules see A910 series Sheets  
 For Owner Equipment Schedule see Sheet A921

For Mechanical Drawings see M series Sheets  
 For Electrical Drawings see E series Sheets

No.	Revision	Date	Initial

**Project**  
 RoW - 84 Frederick St.  
 Renovation & Renewal  
 84 Frederick St  
 Kitchener, ON

	Approved	AD
	Checked	MM
Drawing Title	Drawn	ES

Owner Equipment Schedule

Scale (for 24x36" printing) Dwg. No.  
 n.t.s. A921

John MacDonald Architect inc

**Region of Waterloo**

**84 Frederick St. Renovations**

**RFT # T2024-205**

# **SECTION DETAIL DRAWINGS**

**For Tender, December 19, 2024**

John MacDonald Architect

(519) 579-1700

matthew@johnmacdonaldarchitect.ca

### List of Detail Drawings (8.5" x 11" Sheets)

1-B215	Section Detail @ Mech. Room
2-B215	Section Detail @ Mech. Room at t.o. Wall
3-B215	Section Detail @ Mech. Room at b.o. Wall
4-B215	Section Detail @ Door Sill
5-B215	Section Detail @ Exterior Wall
6-B215	Section Detail @ Mech. Room at Parapet
7a-B215	Section Detail @ Parapet
7b-B215	Section Detail @ Scupper
8a-B215	Section Detail @ Lower Roof @ Base of Wall
8b-B215	Section Detail @ Lower Roof @ Scupper Outlet
9a-B215	Section Detail @ Lower Roof @ Parapet
9b-B215	Section Detail @ Lower Roof @ Scupper
10-B215	Section Detail @ Sloped Roof @ Roof Edge
11-B215	Section Detail @ Sloped Roof @ Roof Peak
12-B215	Section Detail @ Sloped Roof @ RTU Curb
13-B215	Section Detail @ Sloped Roof @ Eave
14-B215	Section Detail @ Sloped Roof @ New Parapet
15-B215	Section Detail @ North Wing Roof @ Low Parapet
16-B215	Section Detail @ North Wing Roof @ High Parapet
17-B215	Section Detail @ North Wing @ New Roof Drain
18-B215	Section Detail @ Community Room @ Parapet
19-B215	Section Detail @ Community Room @ Window
20-B215	Section Detail @ Community Room Roof @ Roof Drain
21-B215	Section Detail @ Planter
22-B215	Section Detail @ Breezeway South Side
23-B215	Section Detail @ Breezeway North Side

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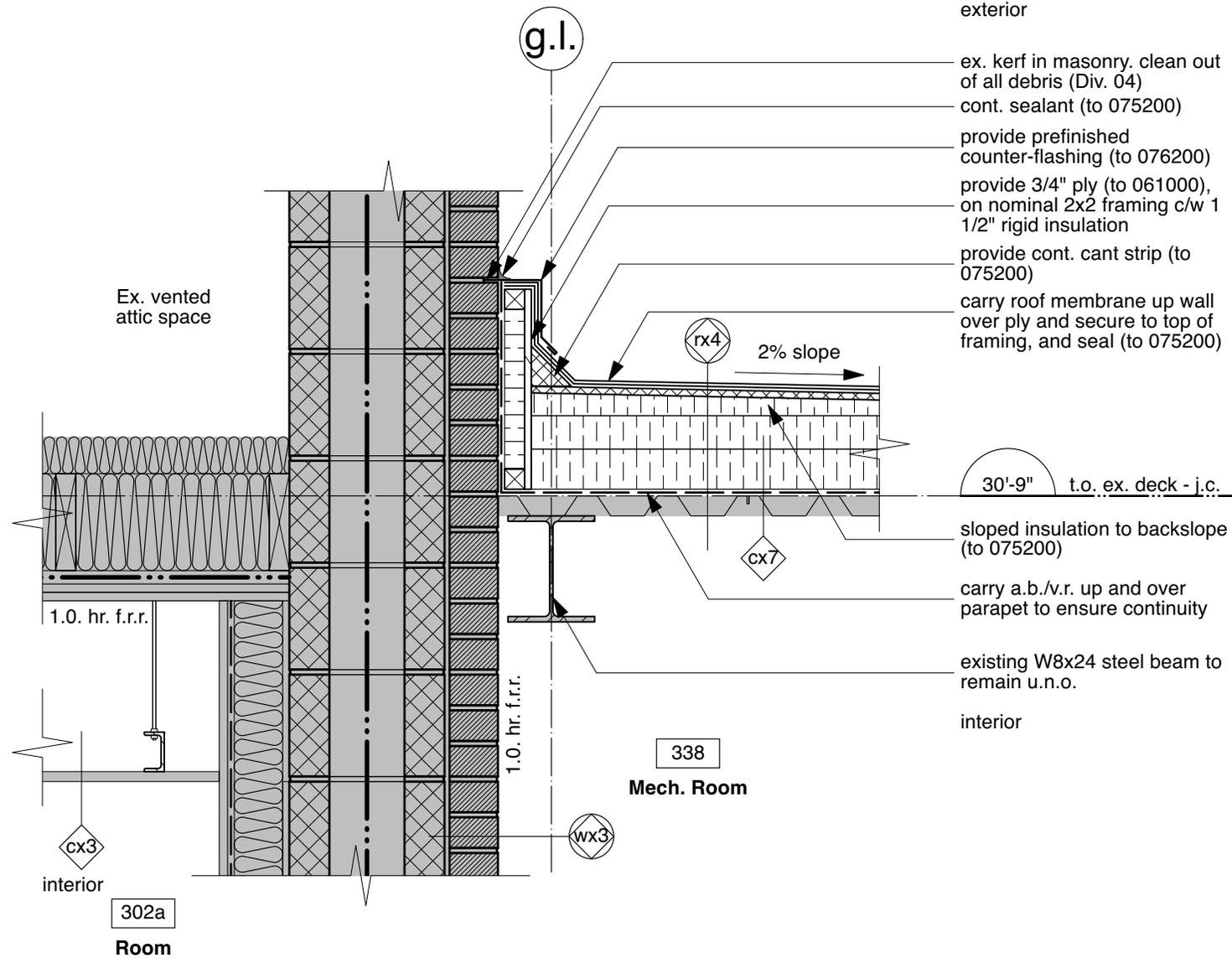
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For roof falls see Roof Plan



exterior

ex. kerf in masonry. clean out of all debris (Div. 04)

cont. sealant (to 075200)

provide prefinished counter-flashing (to 076200)

provide 3/4" ply (to 061000), on nominal 2x2 framing c/w 1/2" rigid insulation

provide cont. cant strip (to 075200)

carry roof membrane up wall over ply and secure to top of framing, and seal (to 075200)

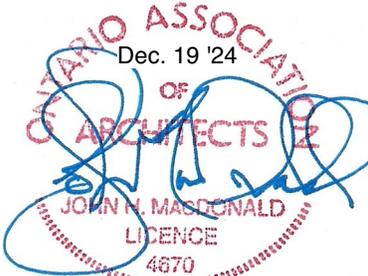
30'-9" t.o. ex. deck - i.c.

sloped insulation to backslope (to 075200)

carry a.b./v.r. up and over parapet to ensure continuity

existing W8x24 steel beam to remain u.n.o.

interior



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2	90% Check Set	Dec. 12 '24	MM
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**Project**  
 RoW - 84 Frederick St.  
 Renovation & Renewal  
 84 Frederick St.  
 Kitchener, ON

	Approved	AD
	Checked	MM
Drawing Title	Drawn	MAM

Section Detail @  
 Mech. Room

Scale (for 8 1/2x11" printing)	Dwg. No.
1" to 1'-0"	1/B215

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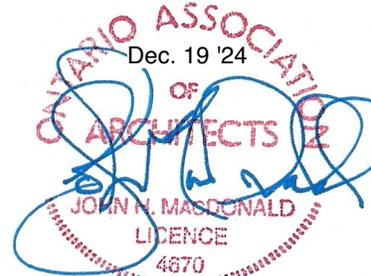
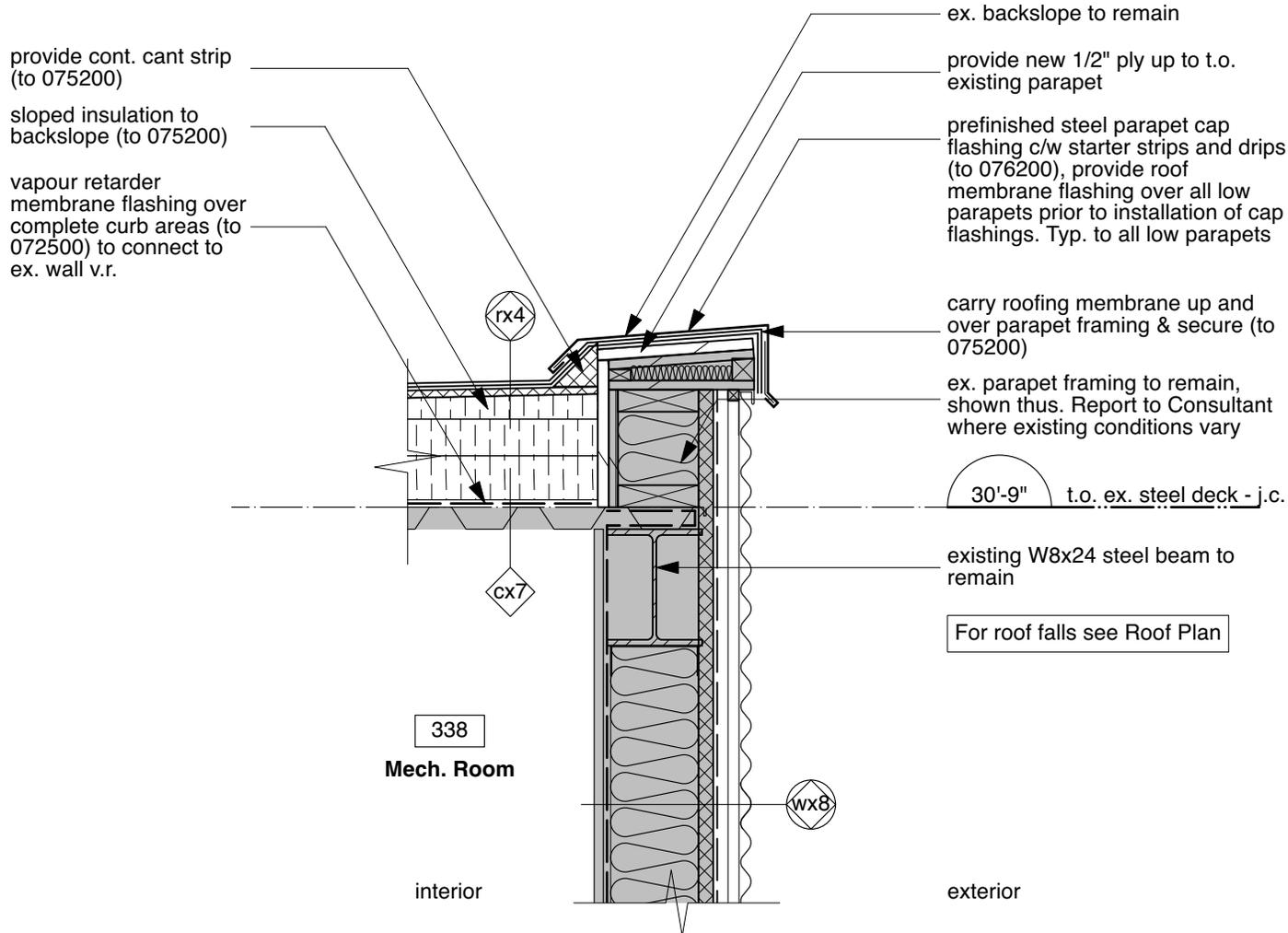
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**Project**  
 RoW - 84 Frederick St.  
 Renovation & Renewal  
 84 Frederick St.  
 Kitchener, ON

Approved	AD
Checked	MM
Drawn	MAM

Section Detail @  
 Mech. Room at t.o. Wall

Scale (for 8 1/2x11" printing) | Dwg. No.  
 1" to 1'-0" | 2/B215

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For roof falls see Roof Plan

exterior

provide all removals and re-installations of ex. steel cladding and trims as may be required to ensure proper lapping of membrane to ex. air barrier

provide a.b. membrane lap over through-wall flashing

carry roof membrane up face of wall and lap over ex. a.b. and seal (to 075200)

provide prefinished thru-wall flashing (to 076200)

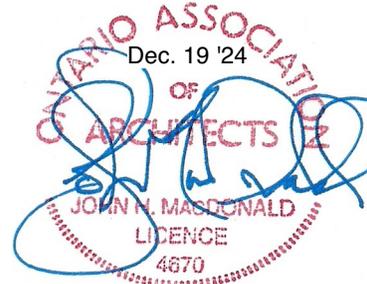
carry roofing membrane up wall over ply and secure to ex. sheathing (to 075200)

provide cont. cant strip (to 075200) 1/2" ply (to 061000) c/w insulation on 2x2 framing

20'-9" t.o. ex. third floor - j.c.

20'-6 3/8" t.o. ex. deck - j.c.

existing structure to remain



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**Project**

RoW - 84 Frederick St.  
Renovation & Renewal  
84 Frederick St.  
Kitchener, ON

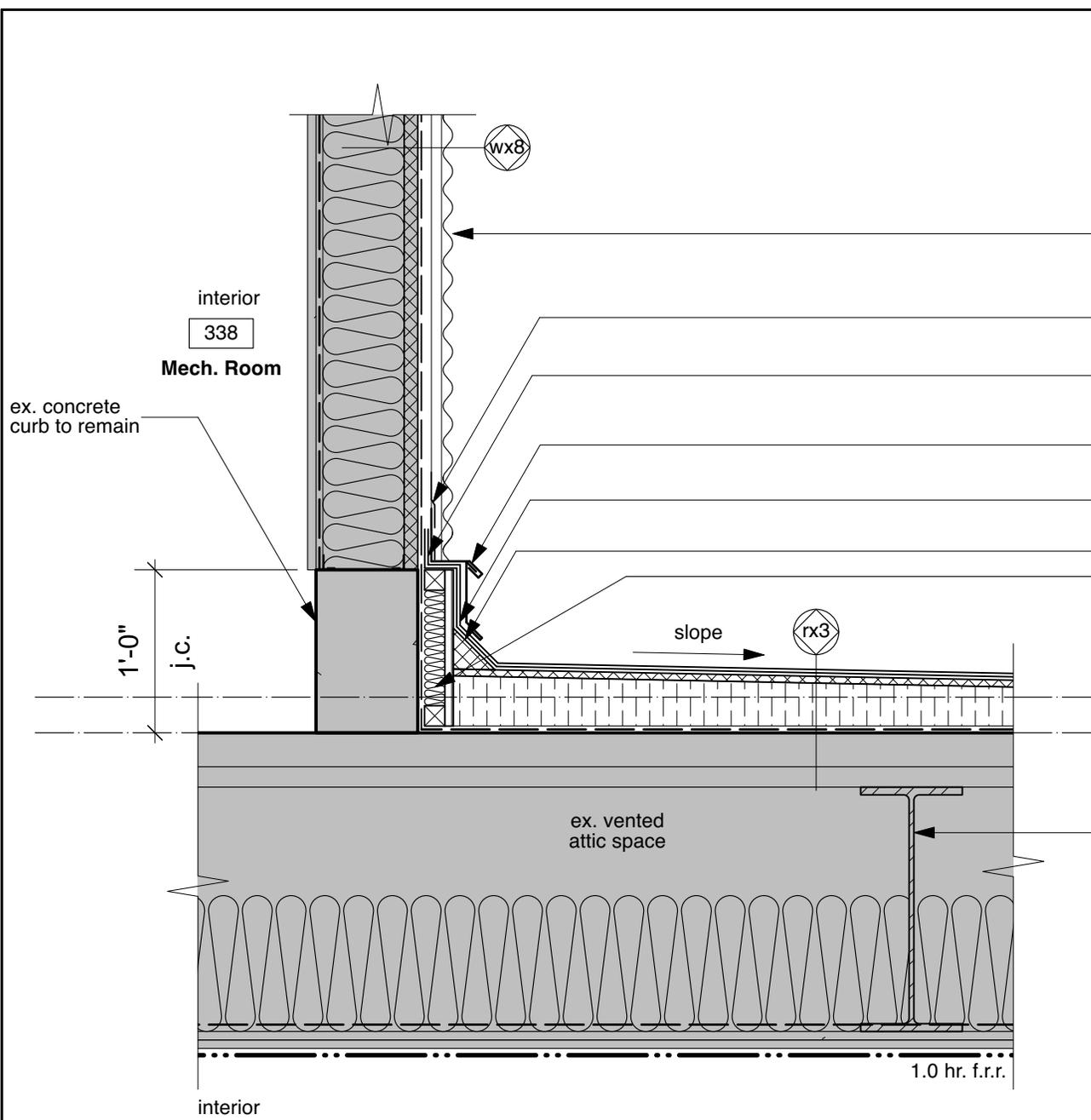
Approved	AD
Checked	MM
Drawn	MAM

Section Detail @  
Mech. Room at b.o. Wall

Scale (for 8 1/2x11" printing)	Dwg. No.
1" to 1'-0"	3/B215

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interior  
338  
Mech. Room

ex. concrete curb to remain

1'-0"  
j.c.

slope

ex. vented attic space

1.0 hr. f.r.r.

interior

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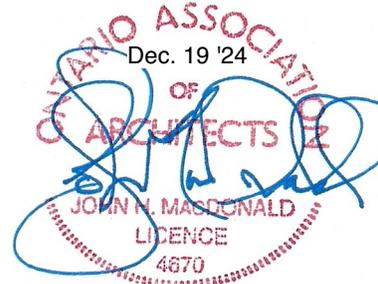
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**TYP. @ OPENINGS:** provide sheet membrane weather barrier connection to frame & seal, typ. to complete perimeter of opening. return at corners to form dam and ship-lap to ensure proper shedding of water. Do not rely on spray or foam-in-place insulation for weather barrier connections.



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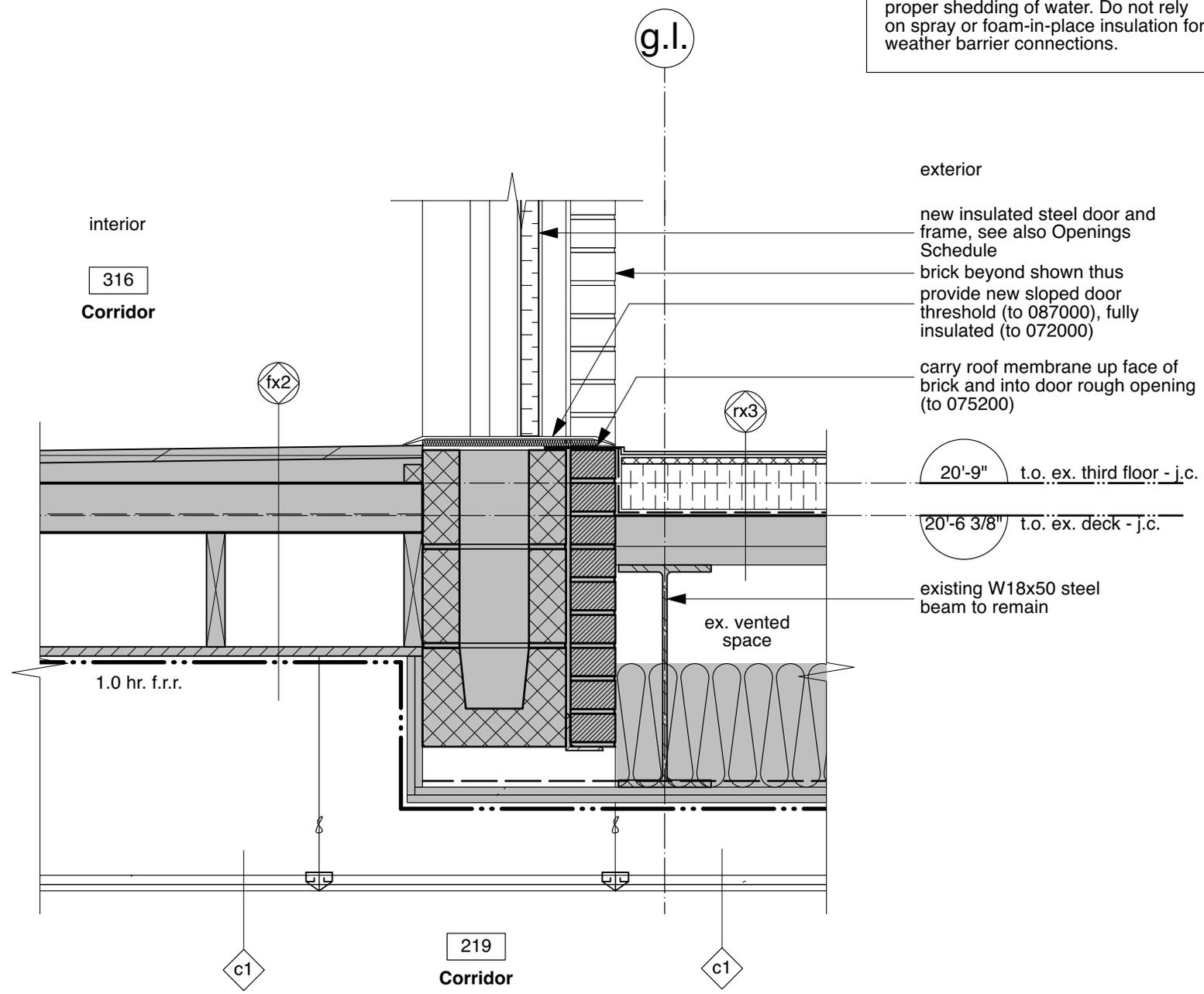
**Project**  
 RoW - 84 Frederick St.  
 Renovation & Renewal  
 84 Frederick St.  
 Kitchener, ON

Approved	AD
Checked	MM
Drawn	MAM

Section Detail @  
 Door Sill

Scale (for 8 1/2x11" printing) | Dwg. No.  
 1" to 1'-0" | 4/B215

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interior  
 316  
 Corridor

exterior  
 new insulated steel door and frame, see also Openings Schedule  
 brick beyond shown thus provide new sloped door threshold (to 087000), fully insulated (to 072000)  
 carry roof membrane up face of brick and into door rough opening (to 075200)

20'-9" t.o. ex. third floor - j.c.

20'-6 3/8" t.o. ex. deck - j.c.

existing W18x50 steel beam to remain

ex. vented space

1.0 hr. f.r.r.

219  
 Corridor

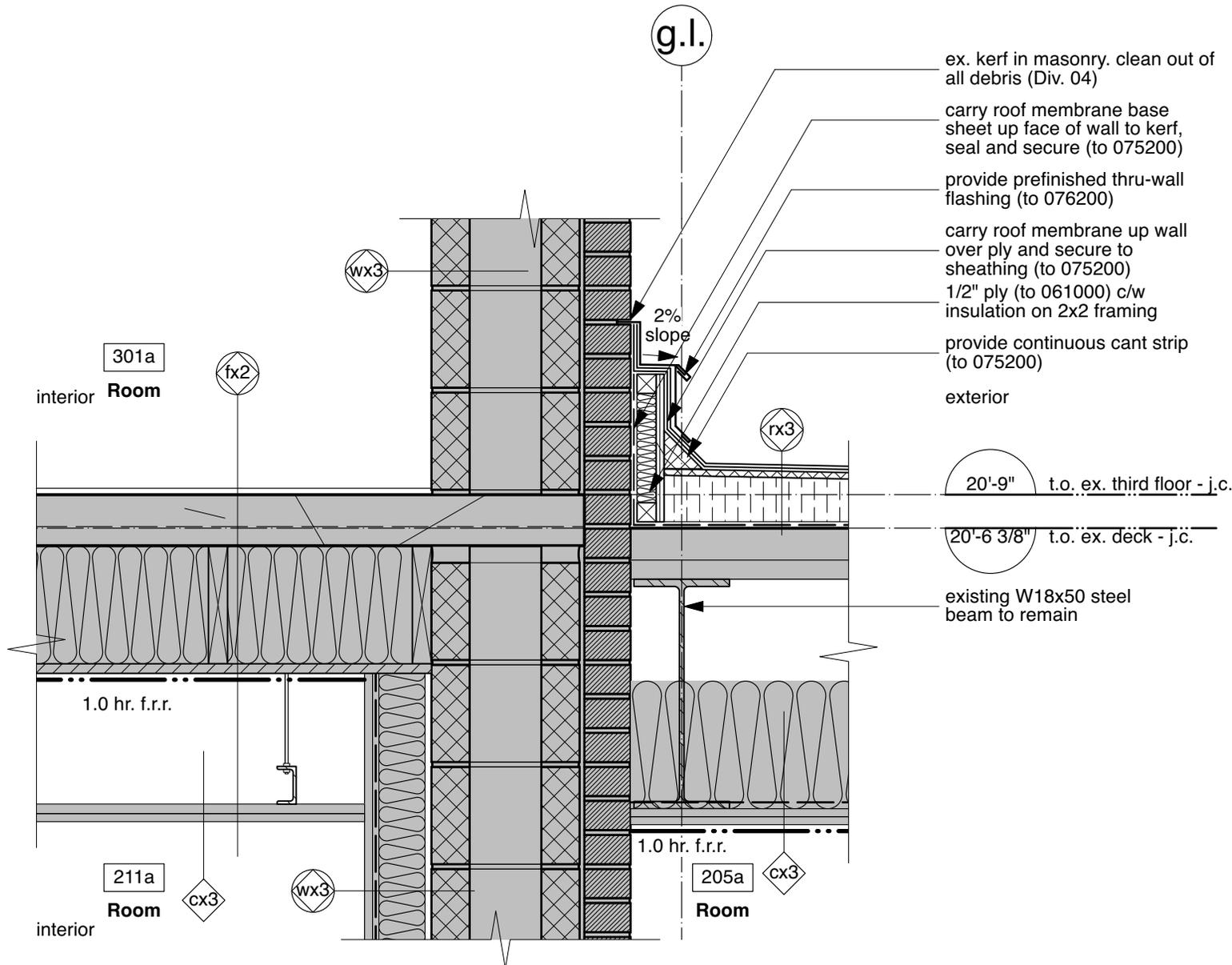
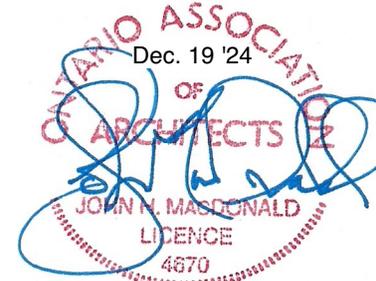
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- ex. kerf in masonry. clean out of all debris (Div. 04)
  - carry roof membrane base sheet up face of wall to kerf, seal and secure (to 075200)
  - provide prefinished thru-wall flashing (to 076200)
  - carry roof membrane up wall over ply and secure to sheathing (to 075200)
  - 1/2" ply (to 061000) c/w insulation on 2x2 framing
  - provide continuous cant strip (to 075200)
- interior
- exterior

20'-9" t.o. ex. third floor - j.c.

20'-6 3/8" t.o. ex. deck - j.c.

existing W18x50 steel beam to remain

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**Project**  
 RoW - 84 Frederick St.  
 Renovation & Renewal  
 84 Frederick St.  
 Kitchener, ON

Approved	AD
Checked	MM
Drawn	MAM

Section Detail @  
 Exterior Wall

Scale (for 8 1/2x11" printing) | Dwg. No.  
 1" to 1'-0" | 5/B215

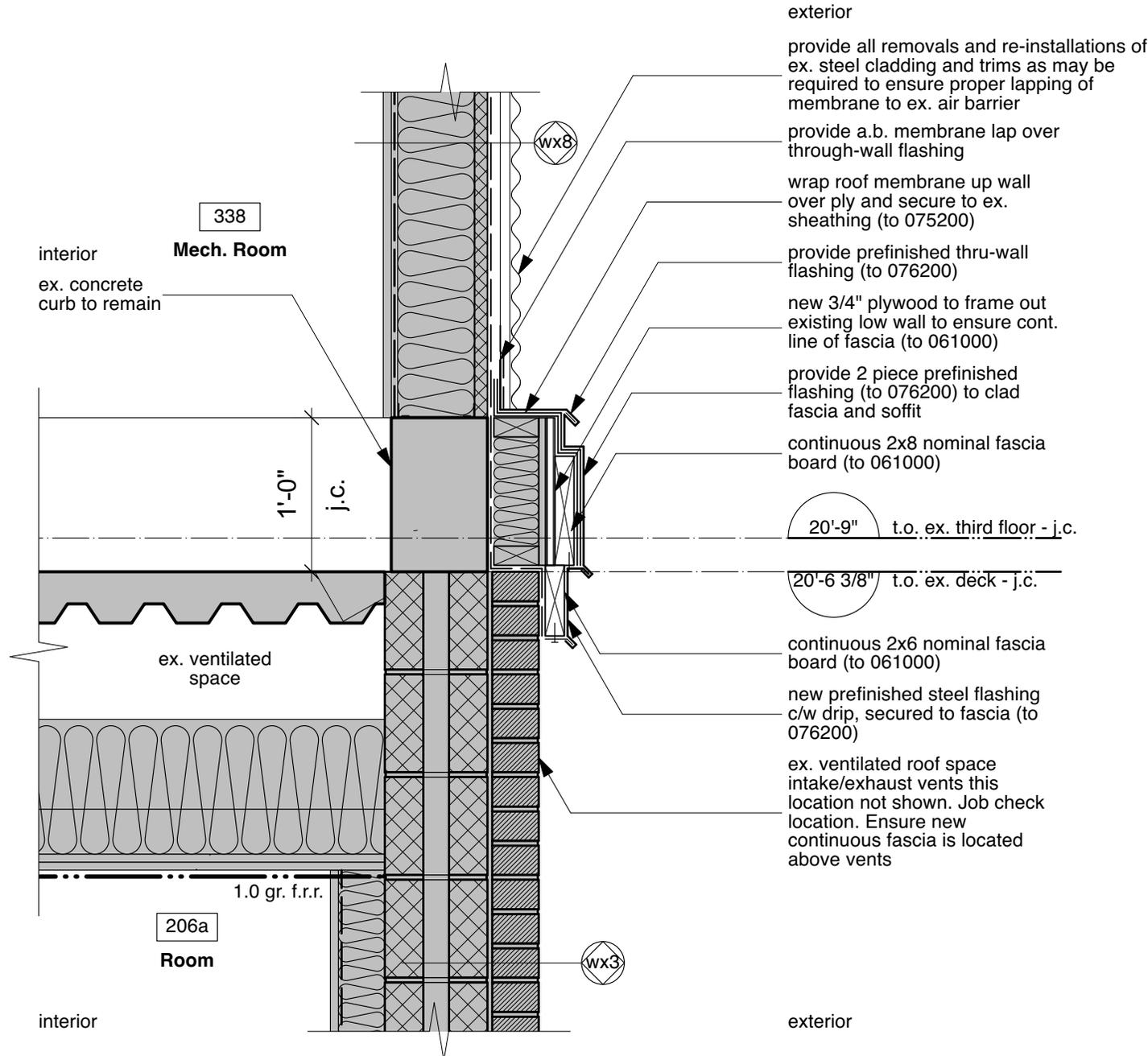
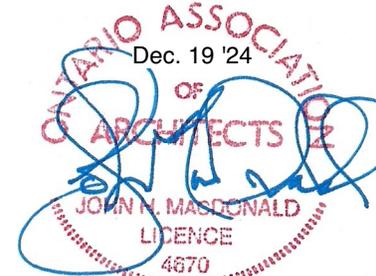
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exterior

provide all removals and re-installations of ex. steel cladding and trims as may be required to ensure proper lapping of membrane to ex. air barrier

provide a.b. membrane lap over through-wall flashing

wrap roof membrane up wall over ply and secure to ex. sheathing (to 075200)

provide prefinished thru-wall flashing (to 076200)

new 3/4" plywood to frame out existing low wall to ensure cont. line of fascia (to 061000)

provide 2 piece prefinished flashing (to 076200) to clad fascia and soffit

continuous 2x8 nominal fascia board (to 061000)

20'-9" t.o. ex. third floor - j.c.

20'-6 3/8" t.o. ex. deck - j.c.

continuous 2x6 nominal fascia board (to 061000)

new prefinished steel flashing c/w drip, secured to fascia (to 076200)

ex. ventilated roof space intake/exhaust vents this location not shown. Job check location. Ensure new continuous fascia is located above vents

exterior

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 84 Frederick St.  
 Kitchener, ON

Approved	AD
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Drawn	MAM

Drawing Title  
 Section Detail @  
 Mech. Room at Parapet

Scale (for 8 1/2x11" printing)	Dwg. No.
1" to 1'-0"	6/B215

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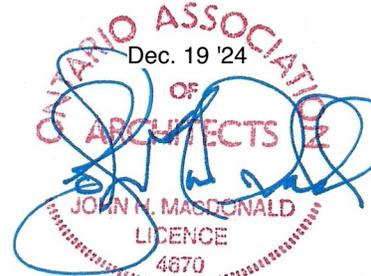
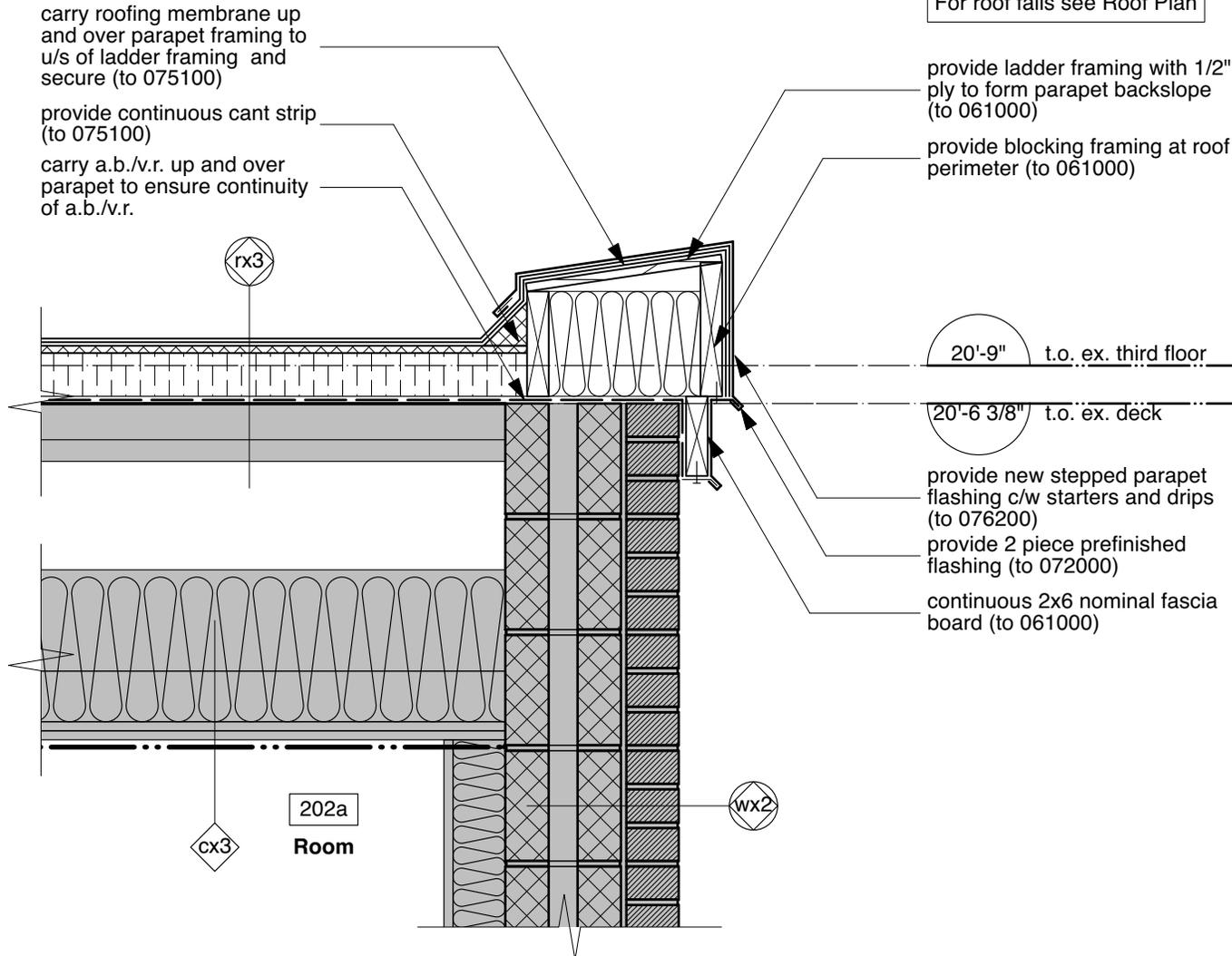
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For roof falls see Roof Plan



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No.	Revision	Date	Initial

### Project

RoW - 84 Frederick St.  
Renovation & Renewal  
84 Frederick St.  
Kitchener, ON

	Approved	AD
	Checked	MM
Drawing Title	Drawn	MAM

Section Detail @  
Parapet

Scale (for 8 1/2x11" printing)	Dwg. No.
1" to 1'-0"	7a/B215

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Public Utilities Commission Building  
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JohnMacDonaldArchitect.ca | (519) 579 1700

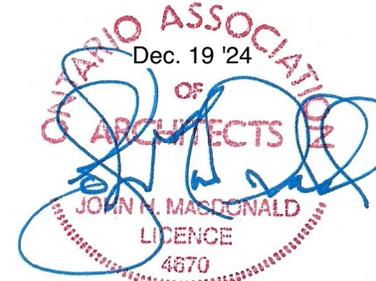
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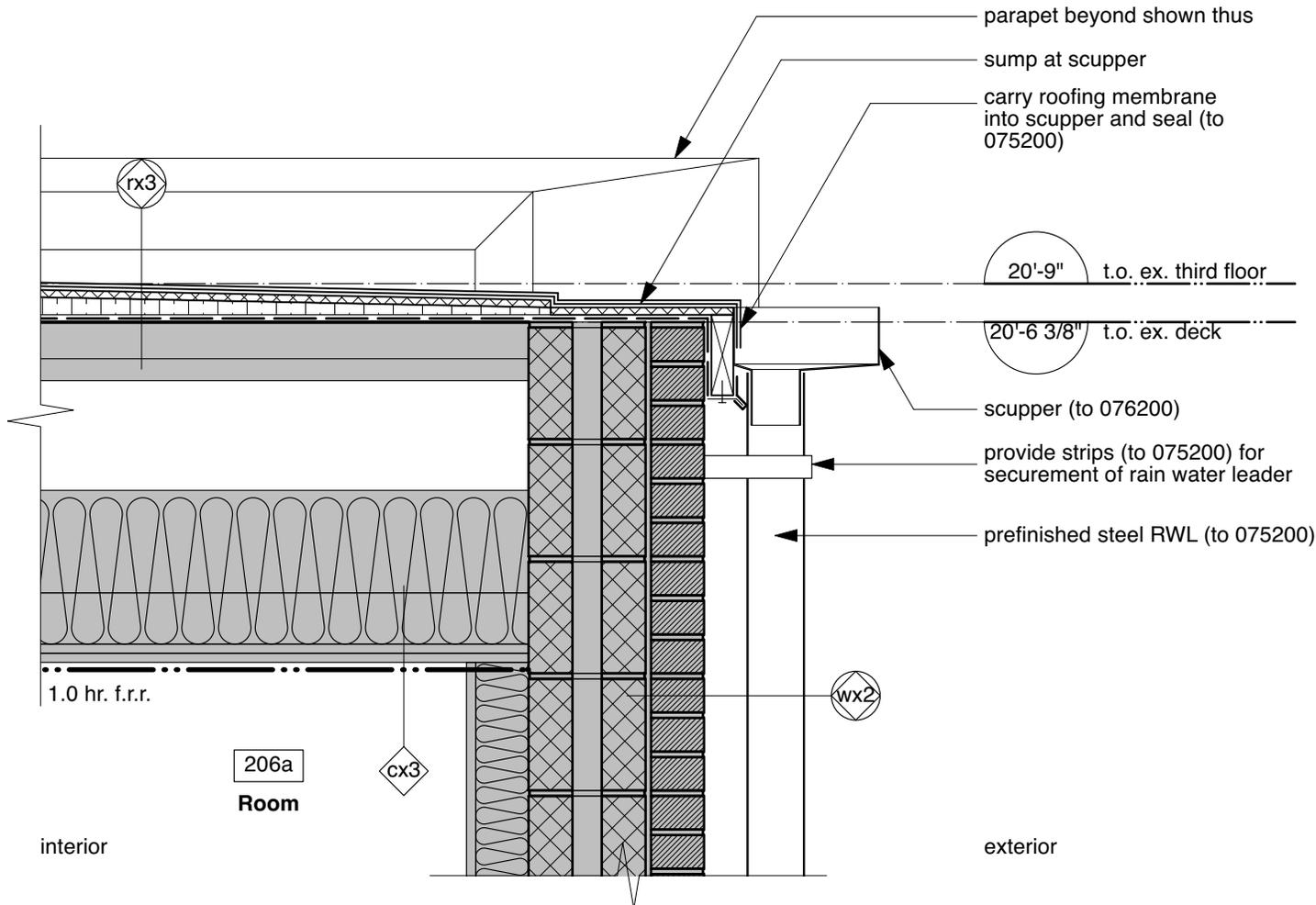
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For roof falls see Roof Plan



No.	Issued for Purpose	Date	Initial
1	30% Check Set	Dec. 05 '24	MM
2	90% Check Set	Dec. 12 '24	MM
T	For Tender	Dec. 19 '24	MM

No.	Revision	Date	Initial

**Project**

RoW - 84 Frederick St.  
Renovation & Renewal  
84 Frederick St.  
Kitchener, ON

Approved	AD
Checked	MM
Drawn	MAM

Section Detail @  
Scupper

Scale (for 8 1/2x11" printing)	Dwg. No.
1" to 1'-0"	7b/B215

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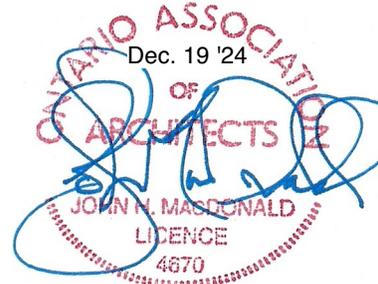
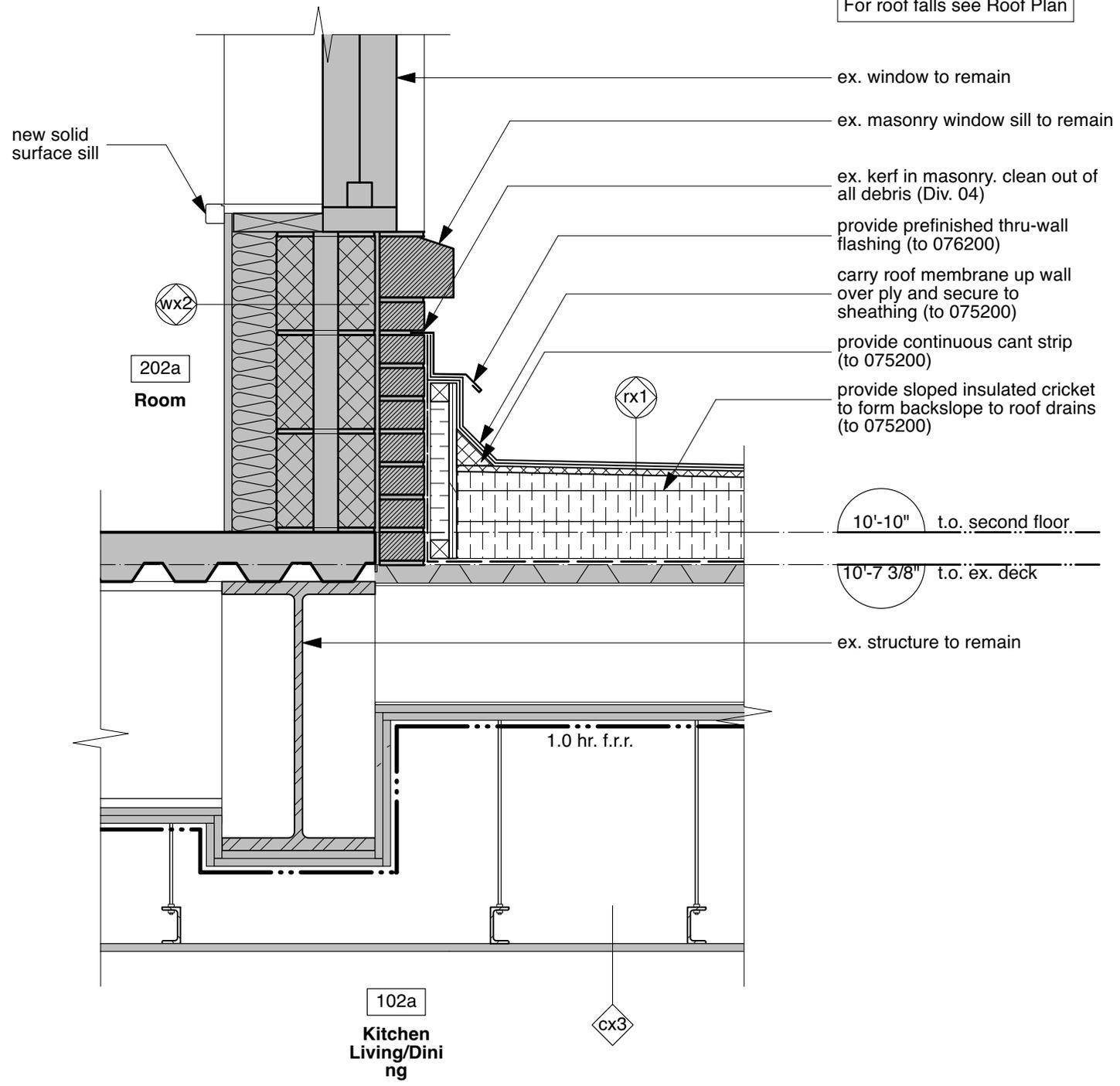
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For roof falls see Roof Plan



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T	For Tender	Dec. 19 '24	MM

No.	Revision	Date	Initial

**Project**

RoW - 84 Frederick St.  
Renovation & Renewal  
84 Frederick St.  
Kitchener, ON

Approved	AD
Checked	MM
Drawn	MAM

Drawing Title

Section Detail @ Lower  
Roof @ Base of Wall

Scale (for 8 1/2x11" printing)	Dwg. No.
1" to 1'-0"	8a/B215

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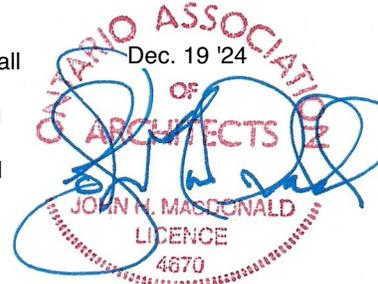
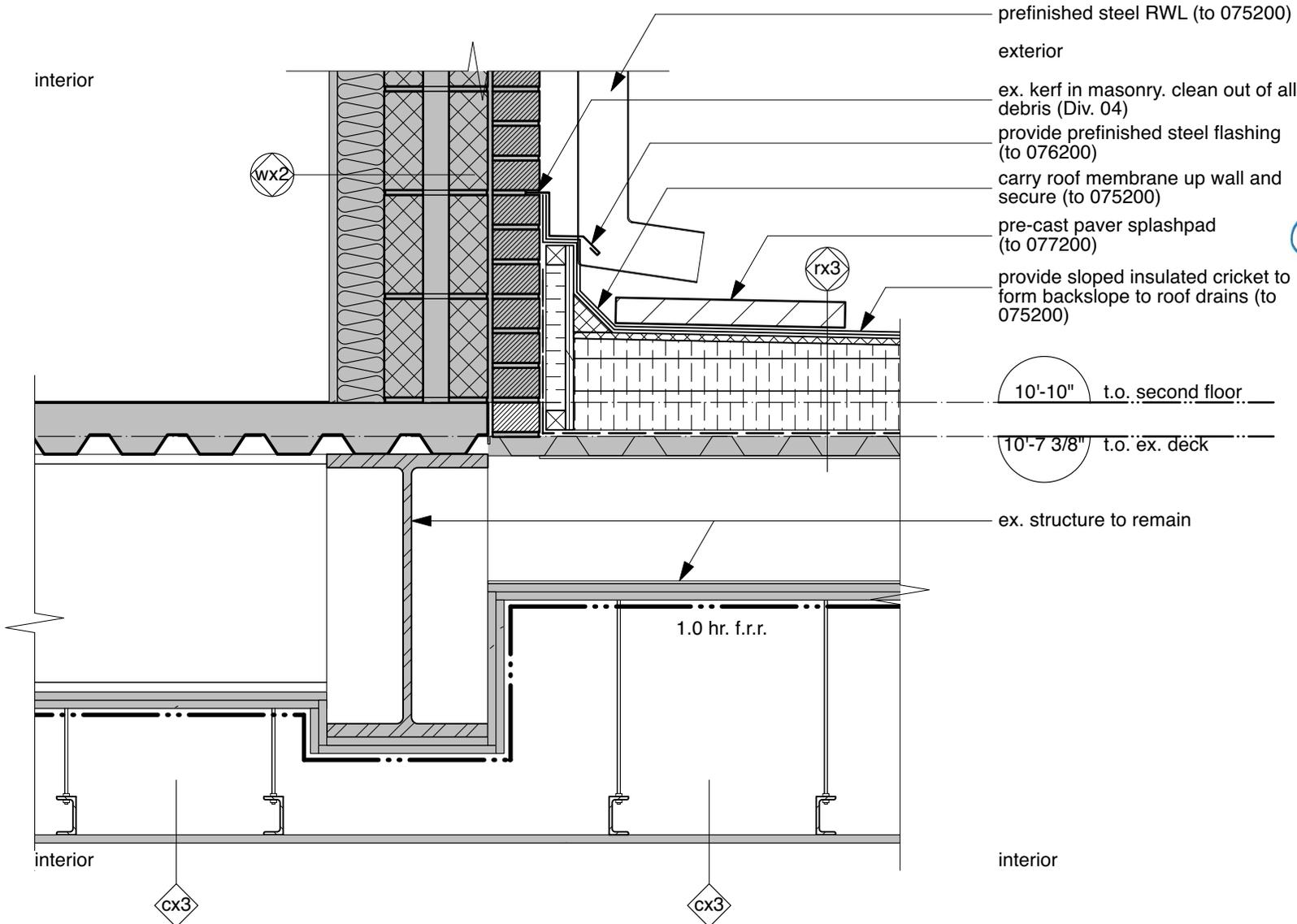
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For roof falls see Roof Plan



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2	90% Check Set	Dec. 12 '24	MM
T	For Tender	Dec. 19 '24	MM

No.	Revision	Date	Initial

**Project**  
 RoW - 84 Frederick St.  
 Renovation & Renewal  
 84 Frederick St.  
 Kitchener, ON

Approved	AD
Checked	MM
Drawn	MAM

Drawing Title  
 Section Detail @ Lower  
 Roof @ Scupper Outlet

Scale (for 8 1/2x11" printing)  
 1" to 1'-0"

Dwg. No.  
 8b/B215

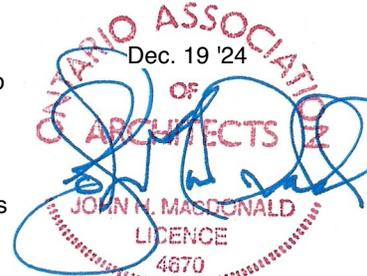
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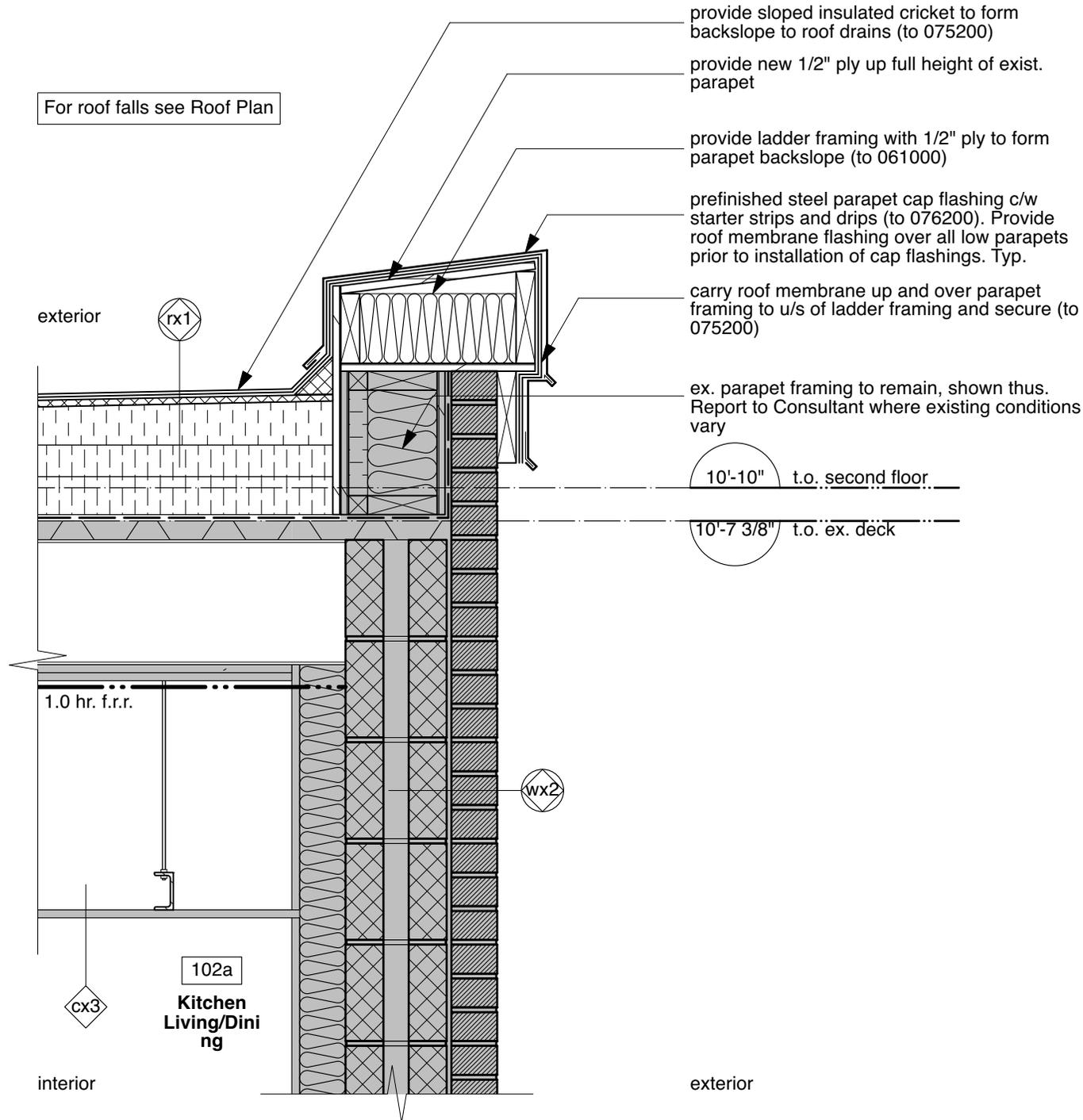
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For roof falls see Roof Plan



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T	For Tender	Dec. 19 '24	MM

No.	Revision	Date	Initial

**Project**  
 RoW - 84 Frederick St.  
 Renovation & Renewal  
 84 Frederick St.  
 Kitchener, ON

Approved	AD
Checked	MM
Drawn	MAM

Drawing Title  
 Section Detail @ Lower  
 Roof @ Parapet

Scale (for 8 1/2x11" printing)	Dwg. No.
1" to 1'-0"	9a/B215

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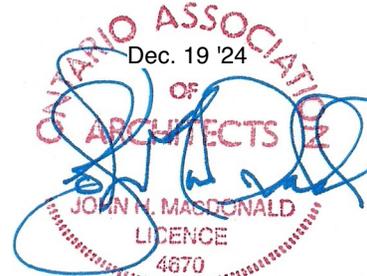
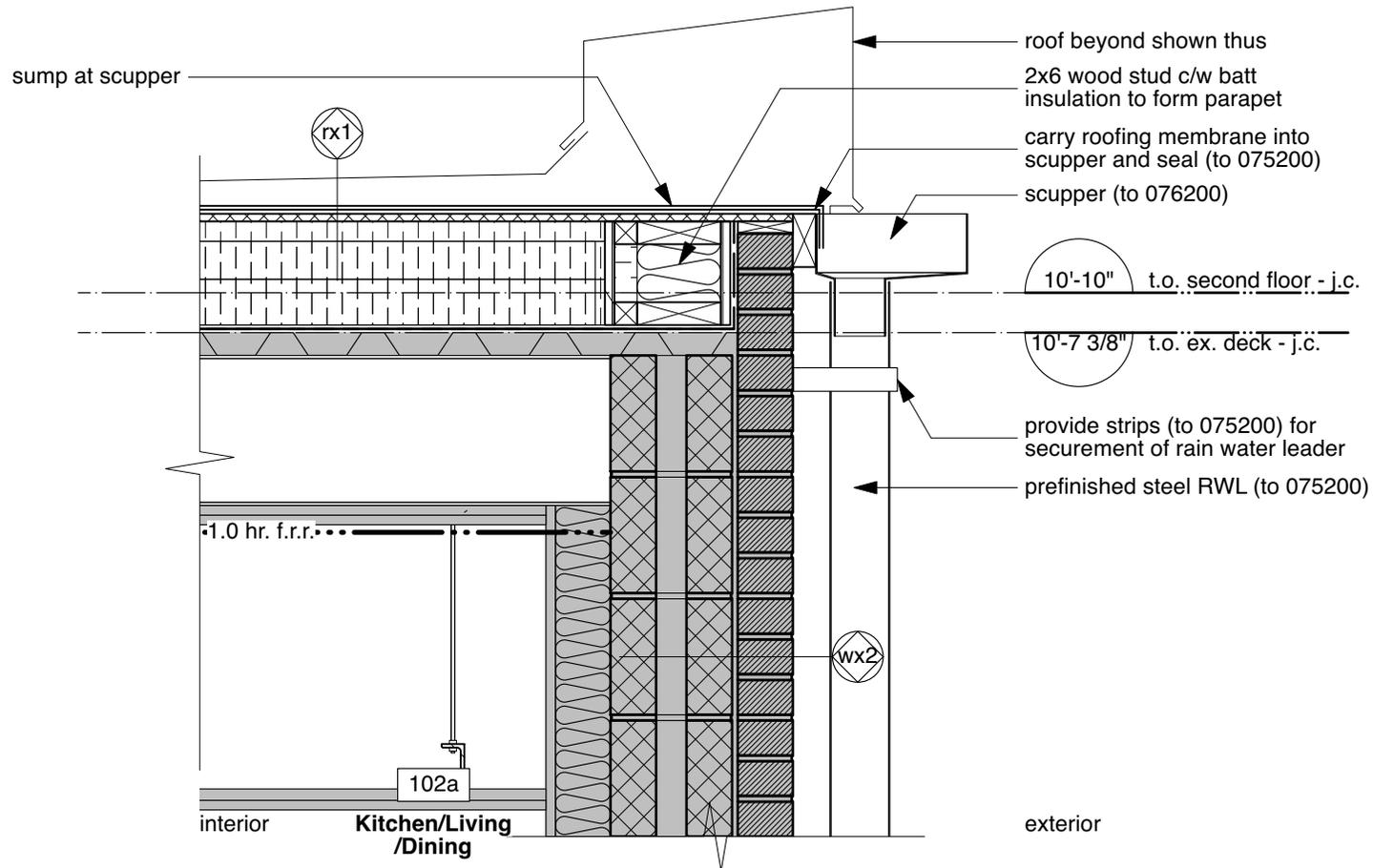
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For roof falls see Roof Plan



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T	For Tender	Dec. 19 '24	MM

No.	Revision	Date	Initial

**Project**  
 RoW - 84 Frederick St.  
 Renovation & Renewal  
 84 Frederick St.  
 Kitchener, ON

	Approved	AD
	Checked	MM
	Drawn	MAM

Drawing Title  
 Section Detail @ Lower  
 Roof @ Scupper

Scale (for 8 1/2x11" printing) Dwg. No.  
 1" to 1'-0" 9b/B215

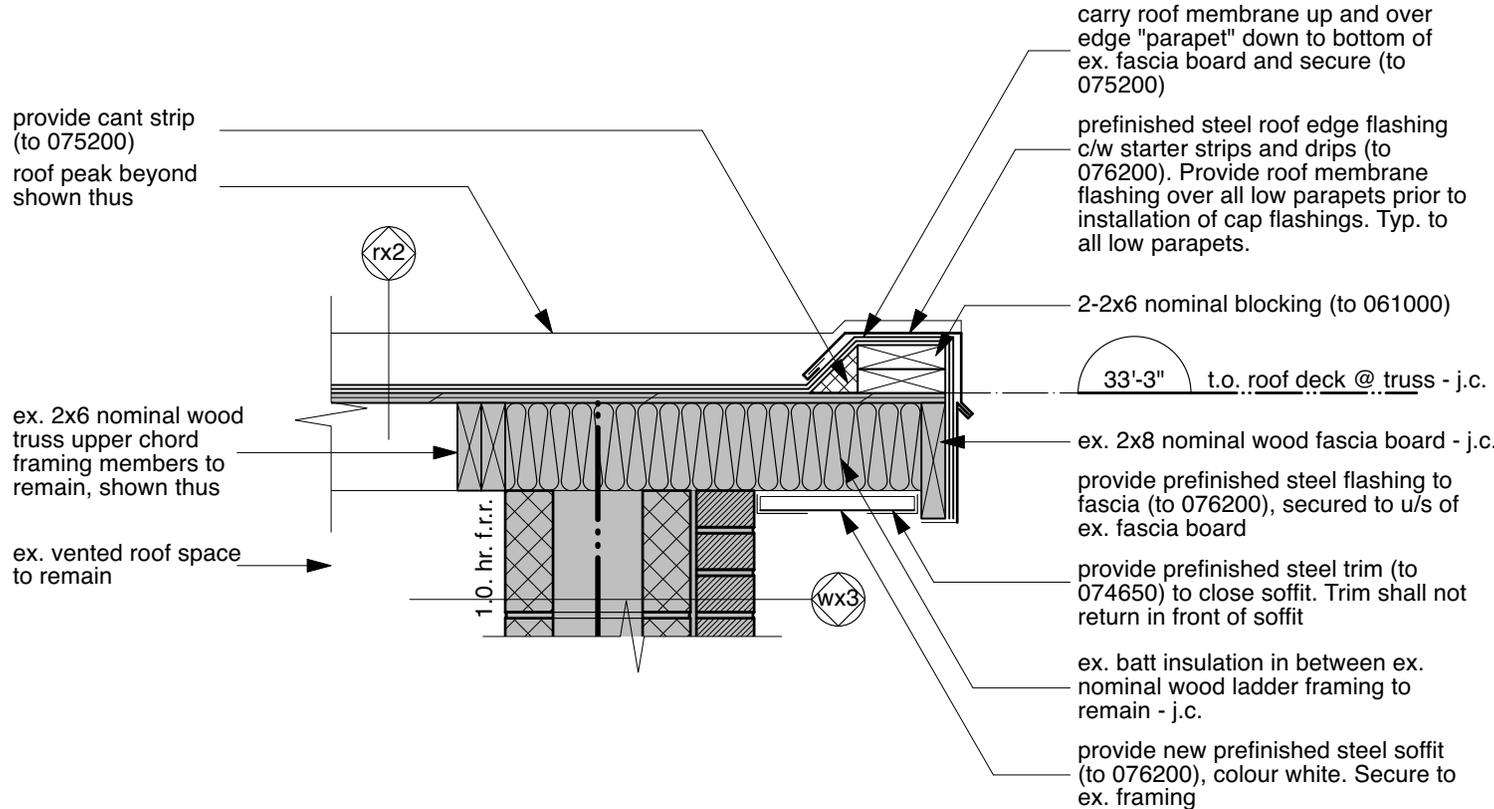
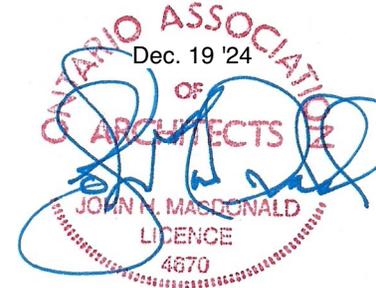
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carry roof membrane up and over edge "parapet" down to bottom of ex. fascia board and secure (to 075200)

prefinished steel roof edge flashing c/w starter strips and drips (to 076200). Provide roof membrane flashing over all low parapets prior to installation of cap flashings. Typ. to all low parapets.

2-2x6 nominal blocking (to 061000)

33'-3" t.o. roof deck @ truss - j.c.

ex. 2x8 nominal wood fascia board - j.c.

provide prefinished steel flashing to fascia (to 076200), secured to u/s of ex. fascia board

provide prefinished steel trim (to 074650) to close soffit. Trim shall not return in front of soffit

ex. batt insulation in between ex. nominal wood ladder framing to remain - j.c.

provide new prefinished steel soffit (to 076200), colour white. Secure to ex. framing

provide cant strip (to 075200) roof peak beyond shown thus

ex. 2x6 nominal wood truss upper chord framing members to remain, shown thus

ex. vented roof space to remain

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2	90% Check Set	Dec. 12 '24	MM
T	For Tender	Dec. 19 '24	MM

No.	Revision	Date	Initial

### Project

RoW - 84 Frederick St.  
Renovation & Renewal  
84 Frederick St.  
Kitchener, ON

Approved	AD
Checked	MM
Drawn	MAM

Section Detail @ Sloped  
Roof @ Roof Edge

Scale (for 8 1/2x11" printing) Dwg. No.

1" to 1'-0" 10/B215

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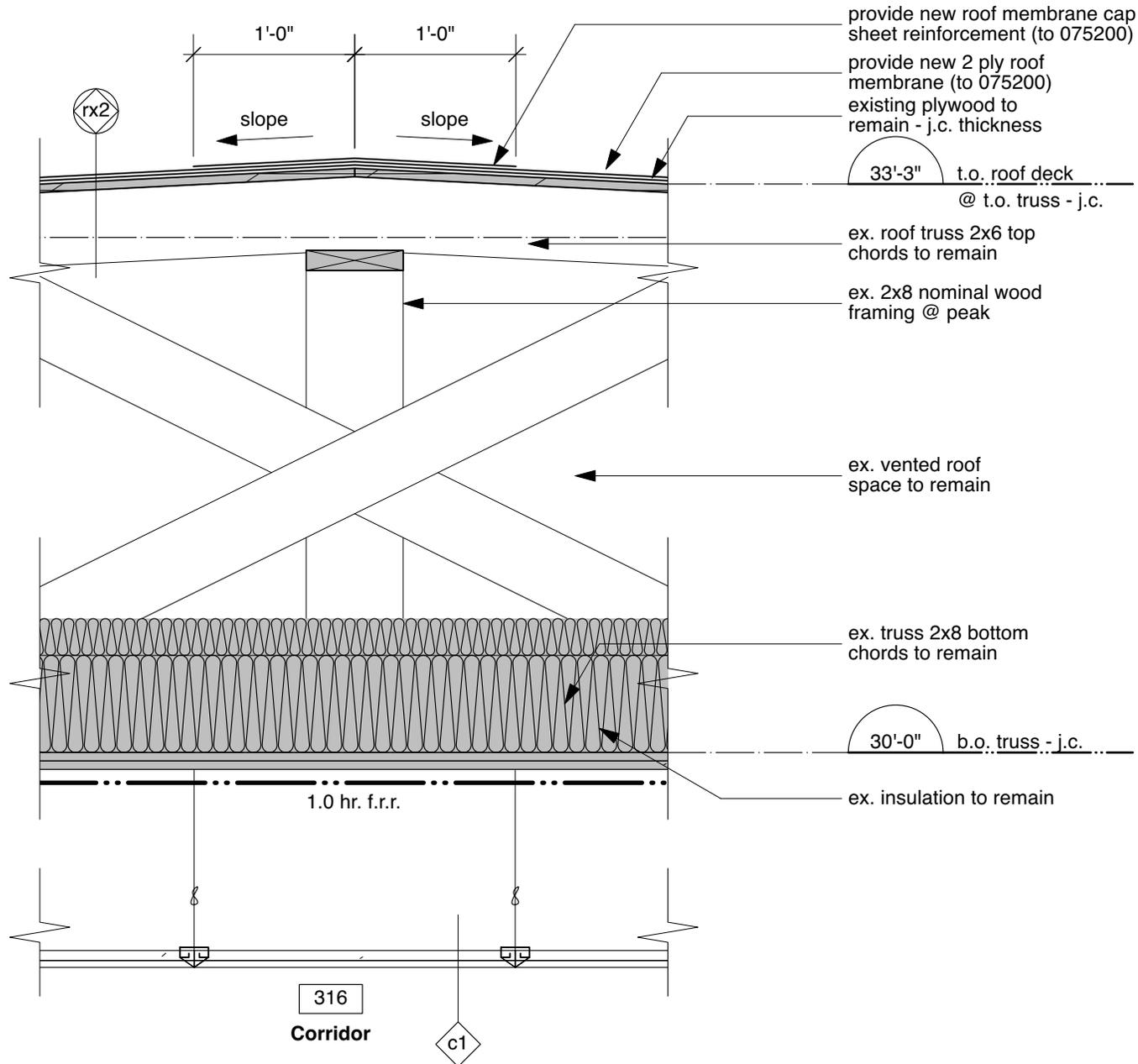
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provide new roof membrane cap sheet reinforcement (to 075200)

provide new 2 ply roof membrane (to 075200)  
existing plywood to remain - j.c. thickness

33'-3" t.o. roof deck  
@ t.o. truss - j.c.

ex. roof truss 2x6 top chords to remain

ex. 2x8 nominal wood framing @ peak

ex. vented roof space to remain

ex. truss 2x8 bottom chords to remain

30'-0" b.o. truss - j.c.

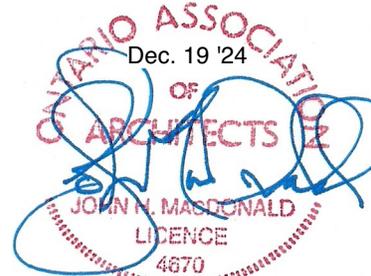
ex. insulation to remain

1.0 hr. f.r.r.

316

Corridor

c1



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2	90% Check Set	Dec. 12 '24	MM
T	For Tender	Dec. 19 '24	MM

No.	Revision	Date	Initial

**Project**

RoW - 84 Frederick St.  
Renovation & Renewal  
84 Frederick St.  
Kitchener, ON

Approved	AD
Checked	MM
Drawn	MAM

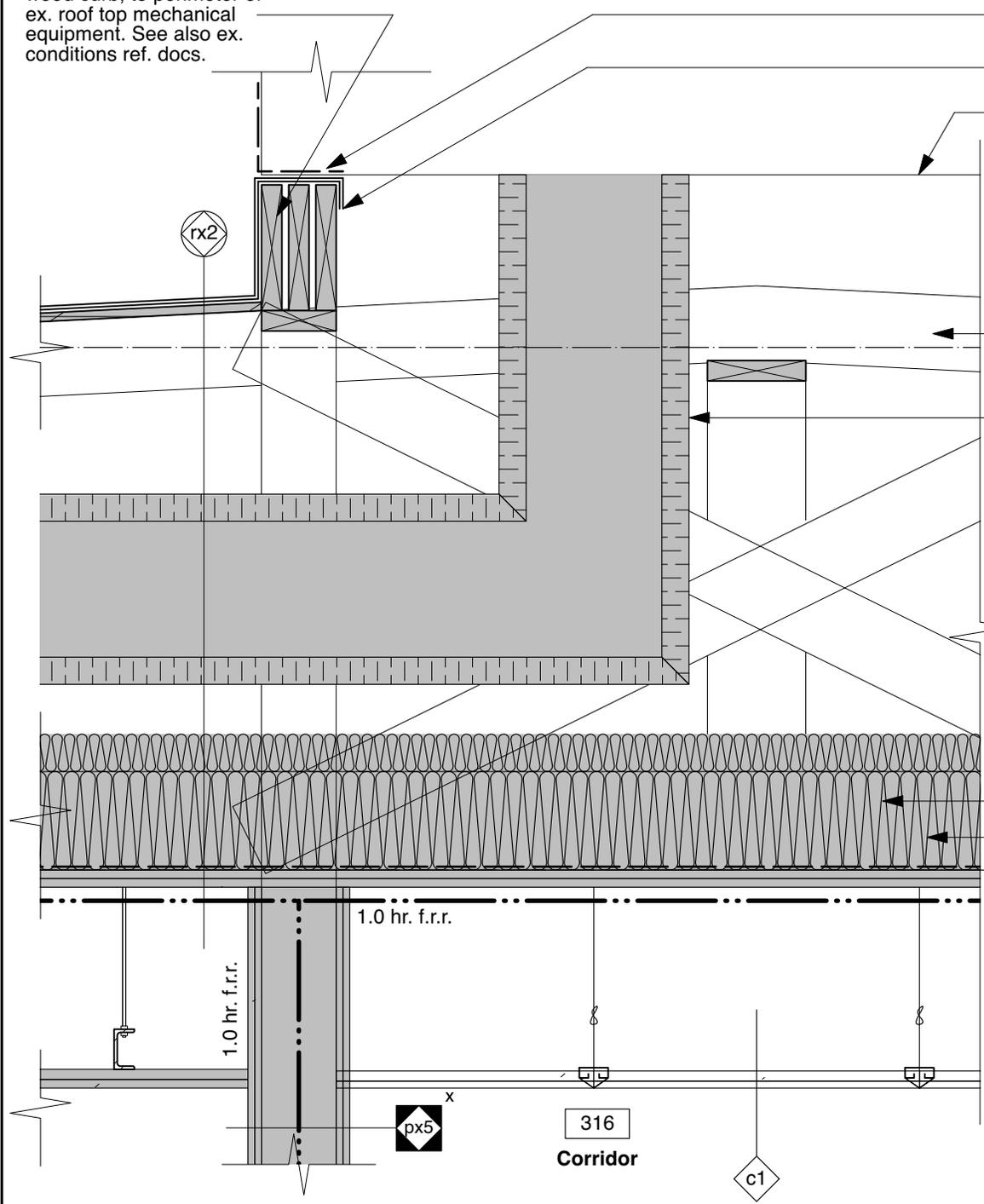
Section Detail @ Sloped  
Roof @ Roof Peak

Scale (for 8 1/2x11" printing)	Dwg. No.
3/4" to 1'-0"	11/B215

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ex. nominal 2x10 built-up wood curb, to perimeter of ex. roof top mechanical equipment. See also ex. conditions ref. docs.



ensure isolation padding to protect roof membrane

carry roof membrane up and over curb and secure

ex. roof top unit shown thus. Disconnect, remove and re-connect ex. RTUs to facilitate re-roofing operations. Co-ordinate with Mech. and Elec. trade contractors

exterior

ex. roof truss 2x6 top chords to remain

ex. insulated ductwork shown thus

interior

ex. truss 2x8 bottom chords to remain

ex. insulation to remain

30'-0" b.o. truss - j.c.

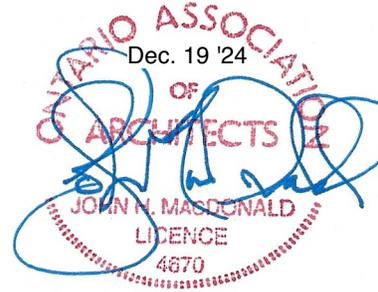
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No.	Revision	Date	Initial

**Project**  
 RoW - 84 Frederick St.  
 Renovation & Renewal  
 84 Frederick St.  
 Kitchener, ON

Approved	AD
Checked	MM
Drawn	MAM

**Drawing Title**  
 Section Detail @ Sloped  
 Roof @ RTU Curb

**Scale** (for 8 1/2x11" printing) **Dwg. No.**  
 3/4" to 1'-0" **12/B215**

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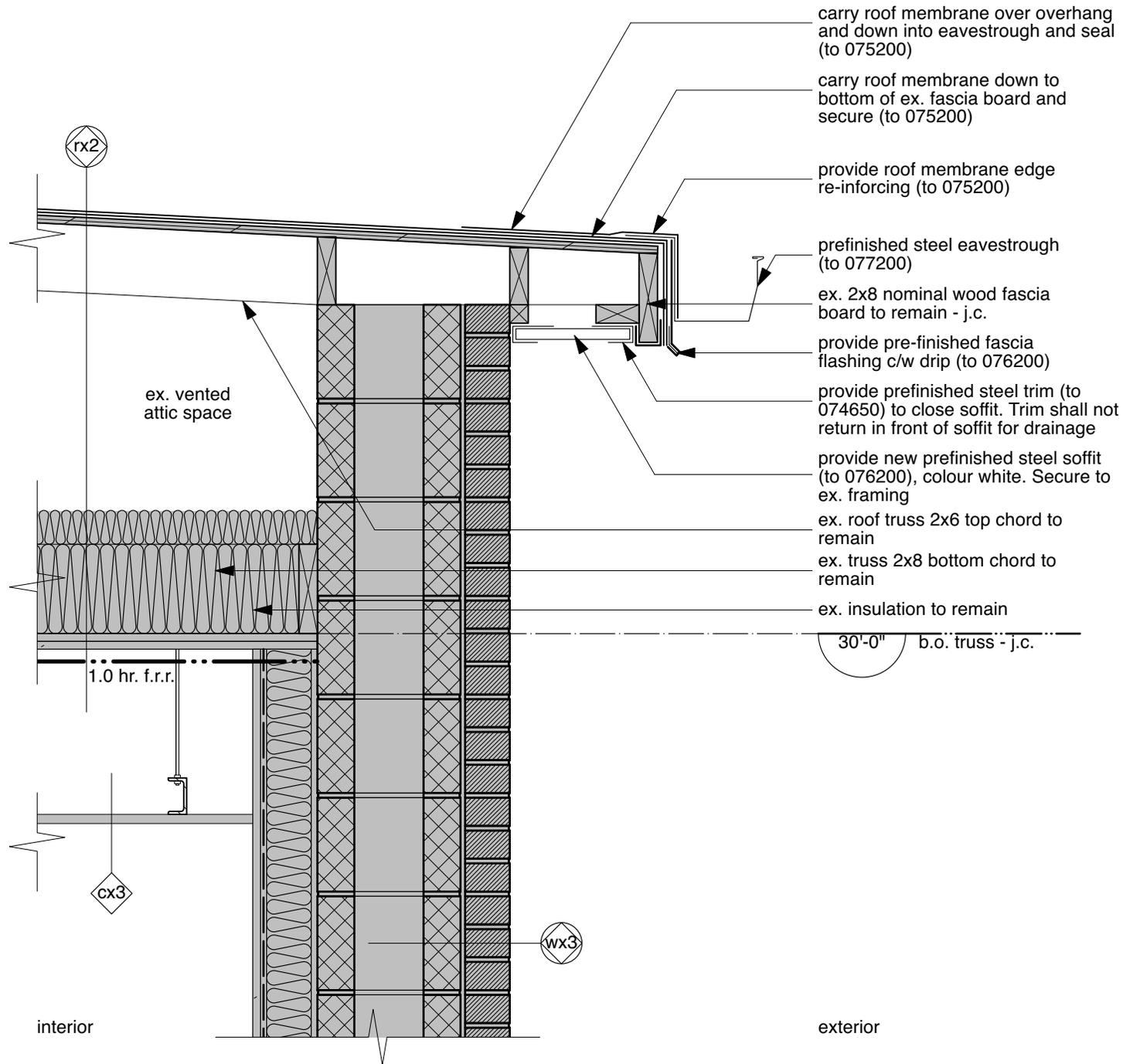
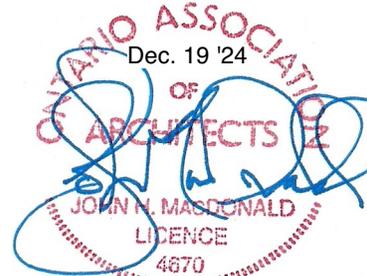
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**Project**  
 RoW - 84 Frederick St.  
 Renovation & Renewal  
 84 Frederick St.  
 Kitchener, ON

Approved AD  
 Checked MM  
 Drawing Title Drawn MAM

Section Detail @ Sloped  
 Roof @ Eave

Scale (for 8 1/2x11" printing) Dwg. No.  
 1" to 1'-0" 13/B215

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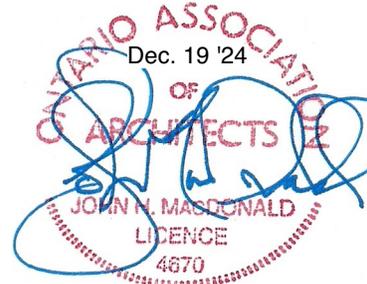
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**Project**  
 RoW - 84 Frederick St.  
 Renovation & Renewal  
 84 Frederick St.  
 Kitchener, ON

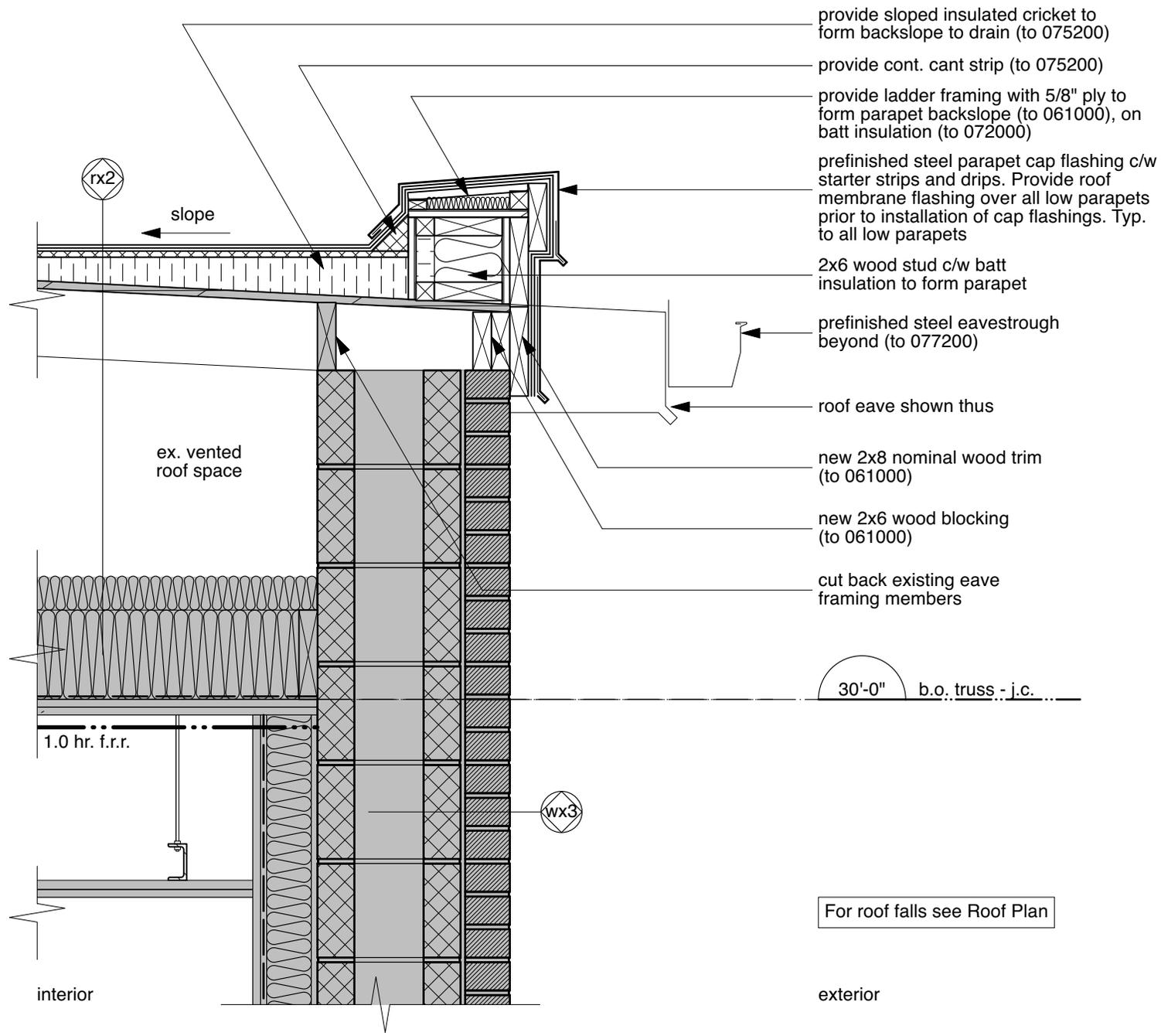
Approved	AD
Checked	MM
Drawn	MAM

**Drawing Title**  
 Section Detail @ Sloped  
 Roof @ New Parapet

Scale (for 8 1/2x11" printing)	Dwg. No.
1" to 1'-0"	14/B215

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- provide sloped insulated cricket to form backslope to drain (to 075200)
- provide cont. cant strip (to 075200)
- provide ladder framing with 5/8" ply to form parapet backslope (to 061000), on batt insulation (to 072000)
- prefinished steel parapet cap flashing c/w starter strips and drips. Provide roof membrane flashing over all low parapets prior to installation of cap flashings. Typ. to all low parapets
- 2x6 wood stud c/w batt insulation to form parapet
- prefinished steel eavestrough beyond (to 077200)
- roof eave shown thus
- new 2x8 nominal wood trim (to 061000)
- new 2x6 wood blocking (to 061000)
- cut back existing eave framing members

30'-0" b.o. truss - j.c.

For roof falls see Roof Plan

interior

exterior

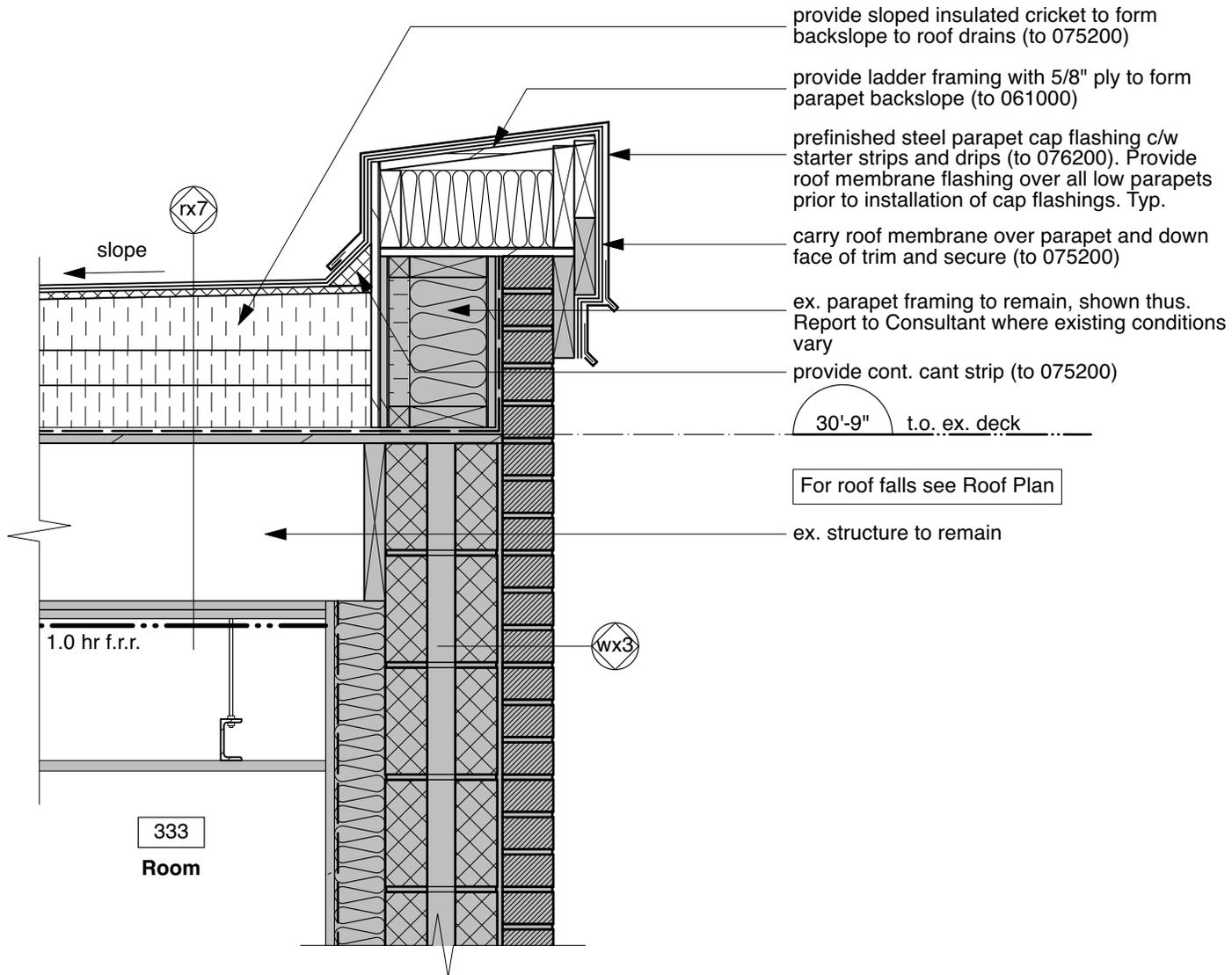
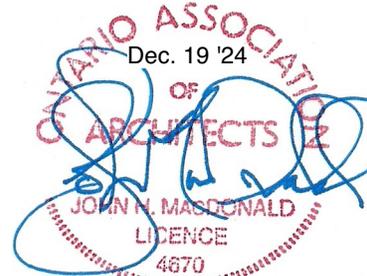
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- provide sloped insulated cricket to form backslope to roof drains (to 075200)
- provide ladder framing with 5/8" ply to form parapet backslope (to 061000)
- prefinished steel parapet cap flashing c/w starter strips and drips (to 076200). Provide roof membrane flashing over all low parapets prior to installation of cap flashings. Typ.
- carry roof membrane over parapet and down face of trim and secure (to 075200)
- ex. parapet framing to remain, shown thus. Report to Consultant where existing conditions vary
- provide cont. cant strip (to 075200)

30'-9" t.o. ex. deck

For roof falls see Roof Plan

ex. structure to remain

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No.	Revision	Date	Initial

**Project**

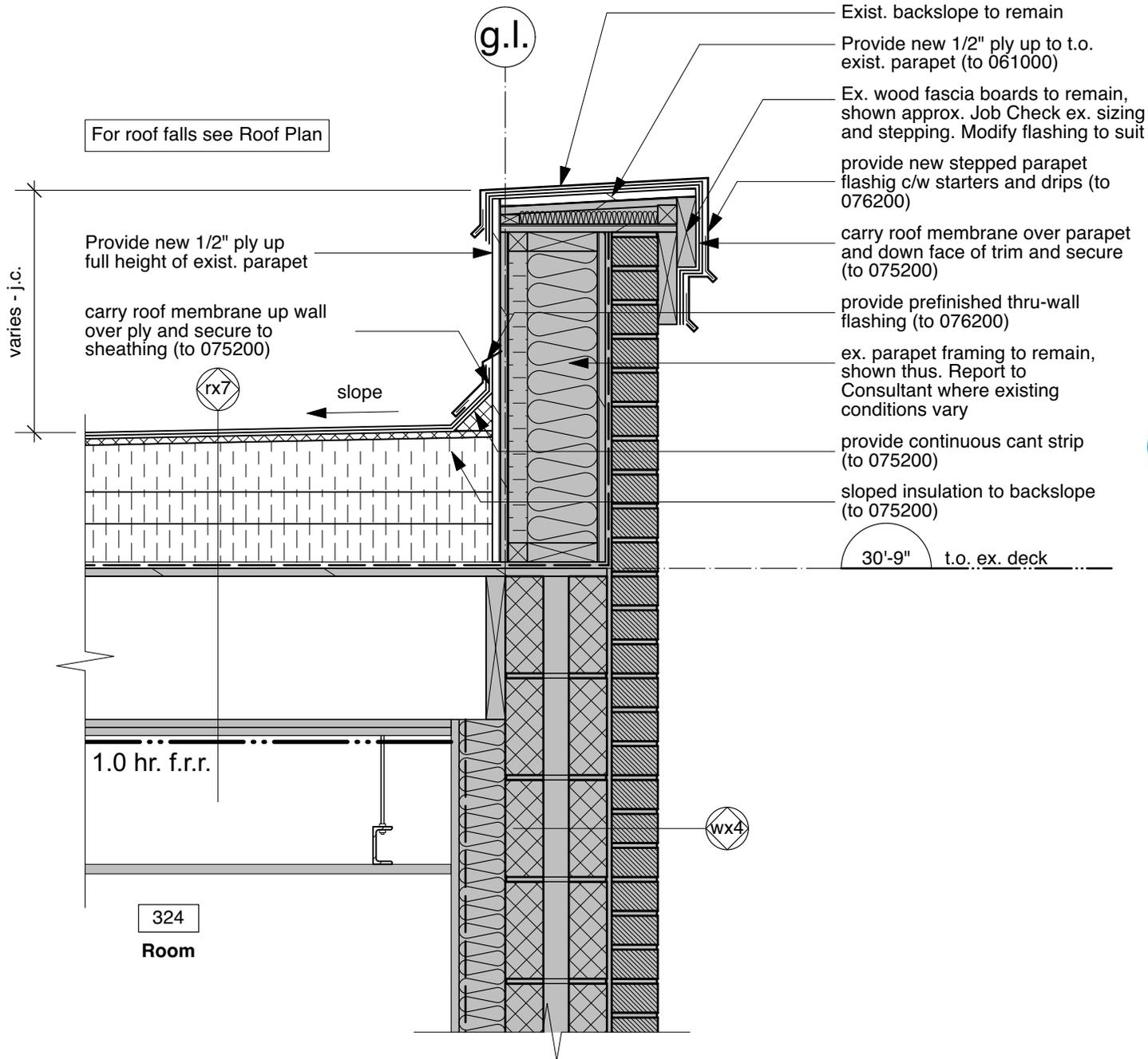
RoW - 84 Frederick St.  
Renovation & Renewal  
84 Frederick St.  
Kitchener, ON

Approved	AD
Checked	MM
Drawn	MAM

Section Detail @ North  
Wing Roof @ Low Parapet

Scale (for 8 1/2x11" printing)	Dwg. No.
1" to 1'-0"	15/B215

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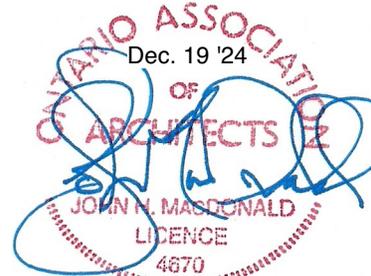
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**Project**

RoW - 84 Frederick St.  
Renovation & Renewal  
84 Frederick St.  
Kitchener, ON

Approved	AD
Checked	MM
Drawn	MAM

Drawing Title

Section Detail @ North  
Wing Roof @ High Parapet

Scale (for 8 1/2x11" printing) Dwg. No.

1" to 1'-0" 16/B215

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For roof falls see Roof Plan

exterior

carry roofing membrane over & into roof drain sump & clamp tight (to 075200)

provide min. 1" sump to min. 2'-0" all sides of roof drain

two ply mod-bit membrane sloped to drain (to 075200)

provide sloped insulated cricket to form backslope to roof drains (to 075200)

30'-9" t.o. ex. deck

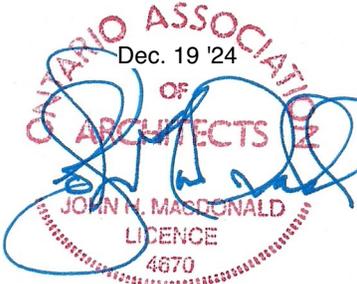
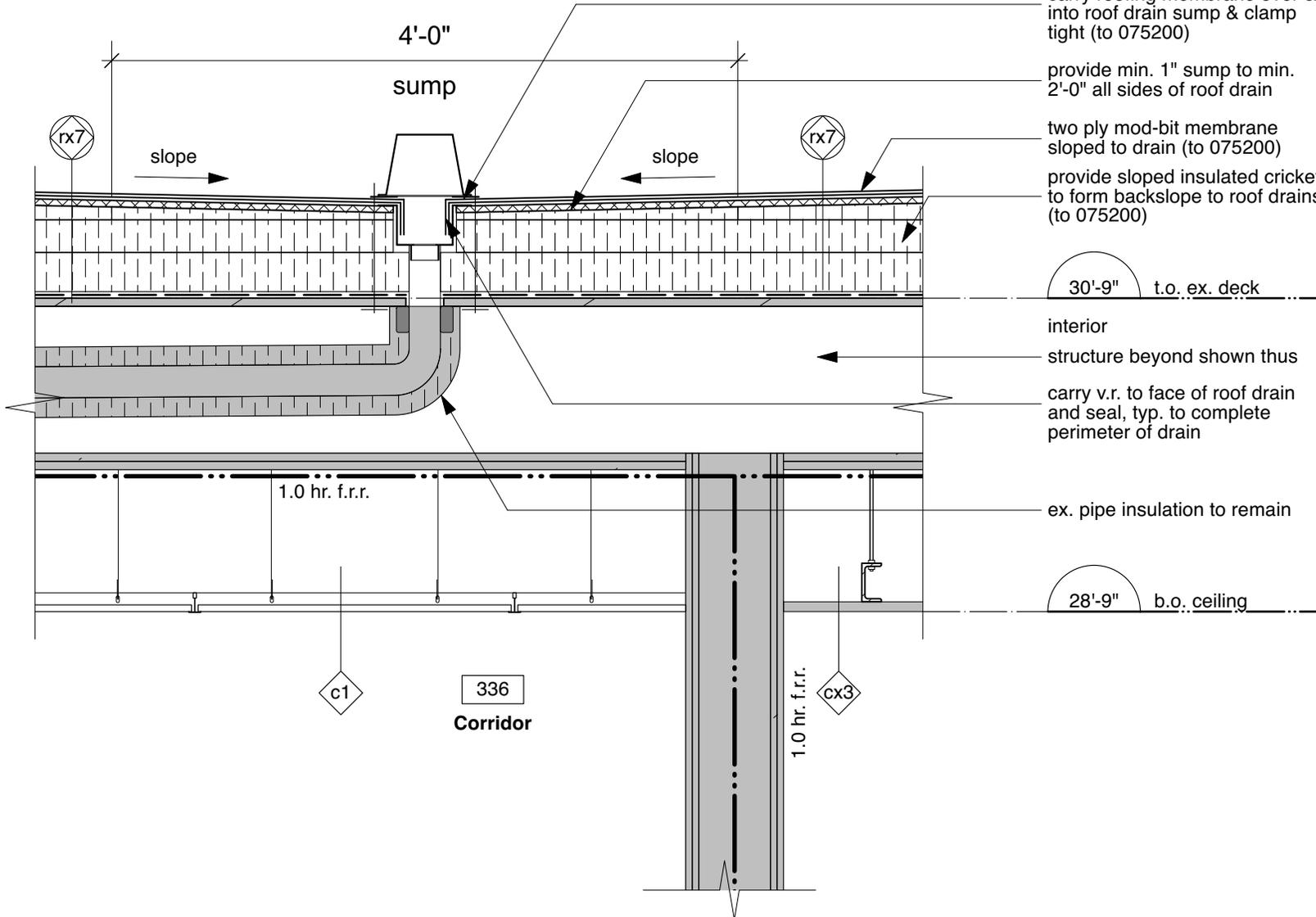
interior

structure beyond shown thus

carry v.r. to face of roof drain and seal, typ. to complete perimeter of drain

ex. pipe insulation to remain

28'-9" b.o. ceiling



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No.	Revision	Date	Initial

**Project**  
 RoW - 84 Frederick St.  
 Renovation & Renewal  
 84 Frederick St.  
 Kitchener, ON

Approved AD  
 Checked MM  
 Drawn MAM

Drawing Title  
 Section Detail @ North  
 Wing @ New Roof Drain

Scale (for 8 1/2x11" printing)  
 1" to 1'-0"

Dwg. No.  
 17/B215

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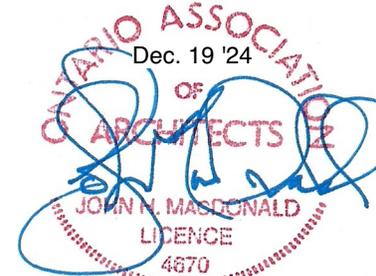
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**Project**

RoW - 84 Frederick St.  
Renovation & Renewal  
84 Frederick St.  
Kitchener, ON

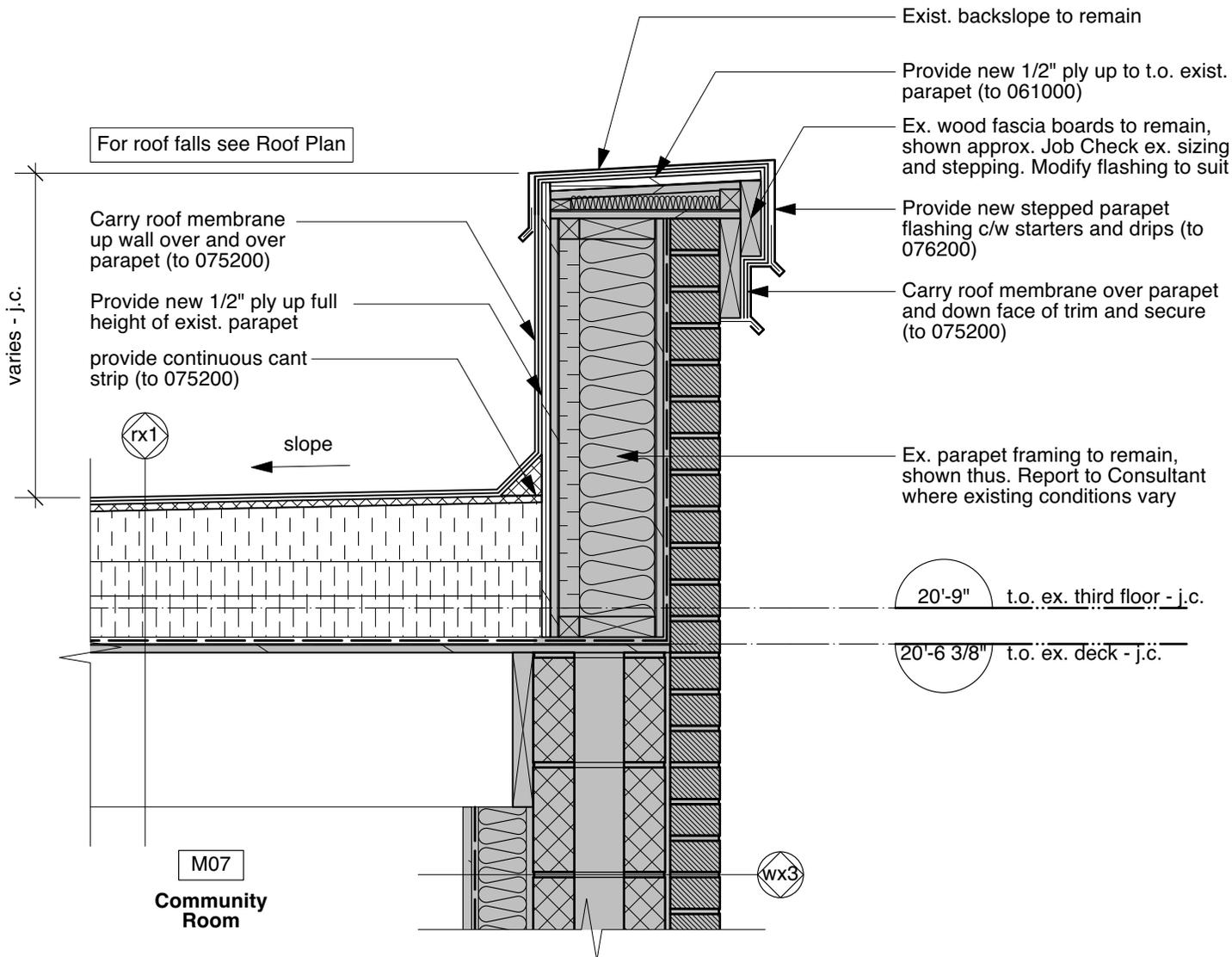
	Approved	AD
	Checked	MM
	Drawn	MAM

Section Detail @  
Community Room @ Parape

Scale (for 8 1/2x11" printing) | Dwg. No.  
1" to 1'-0" | 18/B215

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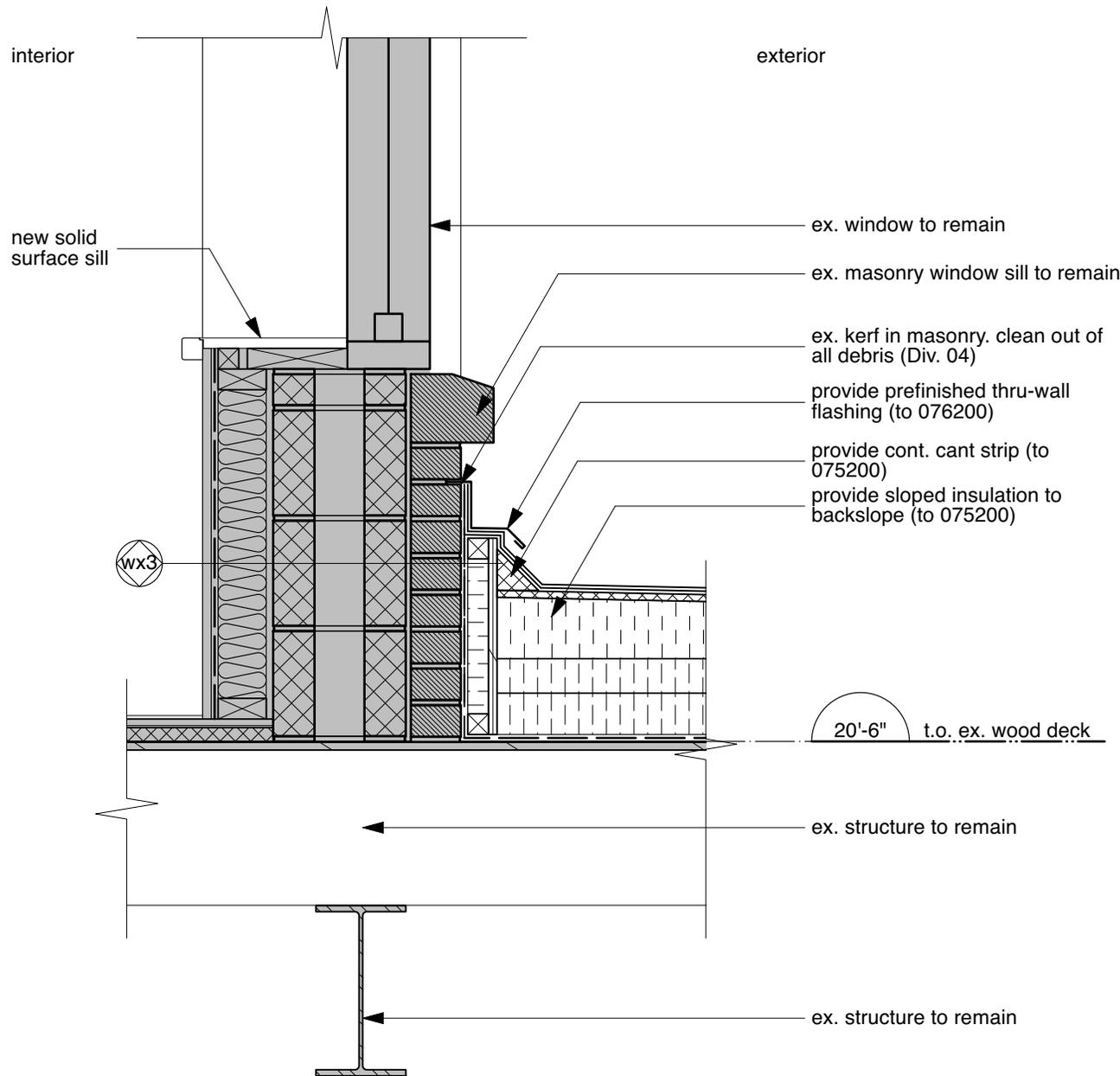
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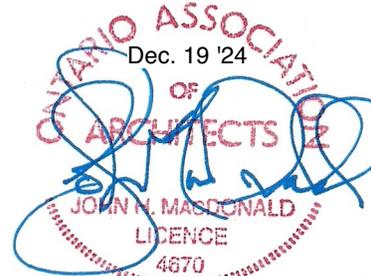
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M07  
Community Room



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**Project**  
 RoW - 84 Frederick St.  
 Renovation & Renewal  
 84 Frederick St.  
 Kitchener, ON

Approved AD  
 Checked MM  
 Drawn MAM

Section Detail @  
 Community Room @ Window

Scale (for 8 1/2x11" printing) 1" to 1'-0"  
 Dwg. No. 19/B215

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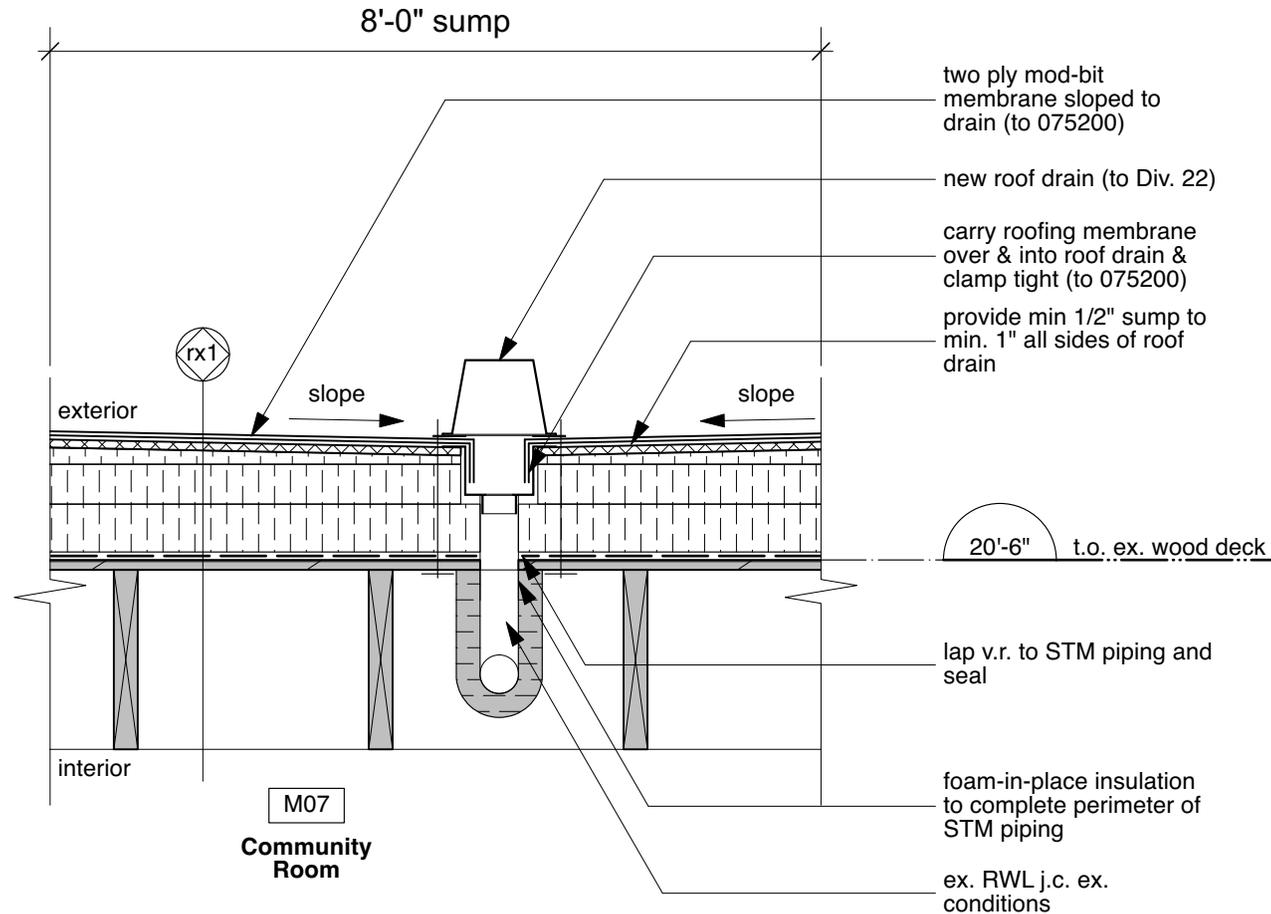
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For roof falls see Roof Plan



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### Project

RoW - 84 Frederick St.  
Renovation & Renewal  
84 Frederick St.  
Kitchener, ON

Approved	AD
Checked	MM
Drawn	MAM

Drawing Title

Section Detail @ Community  
Room Roof @ Roof Drain

Scale (for 8 1/2x11" printing) Dwg. No.

1" to 1'-0"

20/B215

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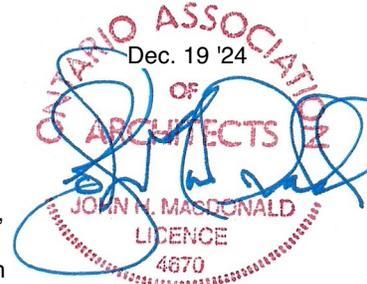
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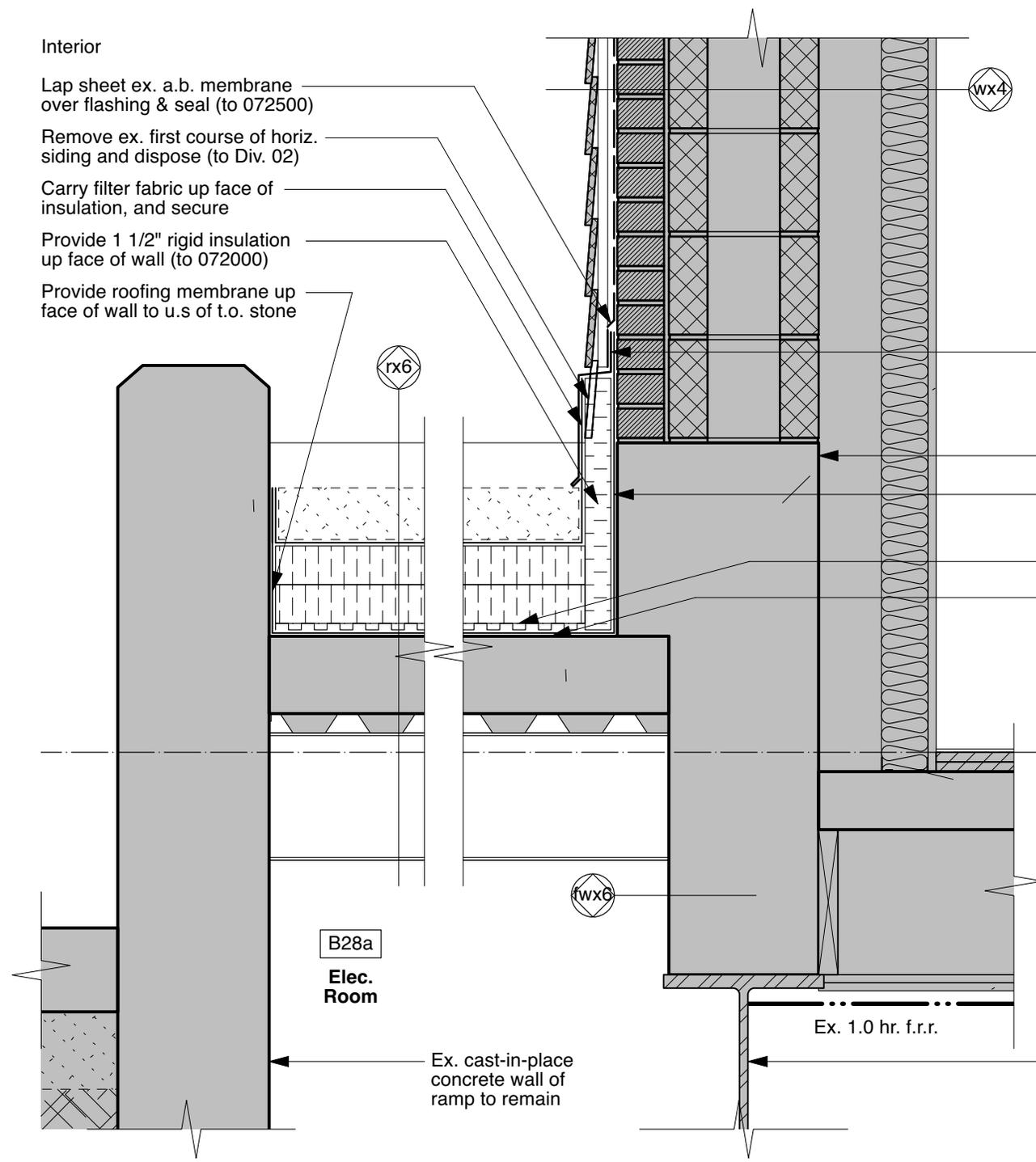


Interior

- Lap sheet ex. a.b. membrane over flashing & seal (to 072500)
- Remove ex. first course of horiz. siding and dispose (to Div. 02)
- Carry filter fabric up face of insulation, and secure
- Provide 1 1/2" rigid insulation up face of wall (to 072000)
- Provide roofing membrane up face of wall to u.s. of t.o. stone

Interior

- Provide new prefinished through wall flashing (to 076200), secured to masonry and overtop of roof membrane, to extend down to t.o. stone
- Ex. concrete low wall to remain
- Carry roof membrane up face of wall and on to brick masonry and secure
- Provide drainage board
- Provide new cementitious topping to t.o. ex. concrete slab, to provide slope to new drain outlet. See also Site Plan.



B28a  
Elec. Room

Ex. cast-in-place concrete wall of ramp to remain

Ex. 1.0 hr. f.r.r.

100'-0" t.o. ex. main floor - i.c.

Ex. steel beam, exposed in the finished work, to remain

Interior

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**Project**  
 RoW - 84 Frederick St.  
 Renovation & Renewal  
 84 Frederick St.  
 Kitchener, ON

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 Checked MM  
 Drawing Title Drawn MAM

Section Detail @  
 Planter

Scale (for 8 1/2x11" printing) Dwg. No.  
 1" to 1'-0" 21/B215

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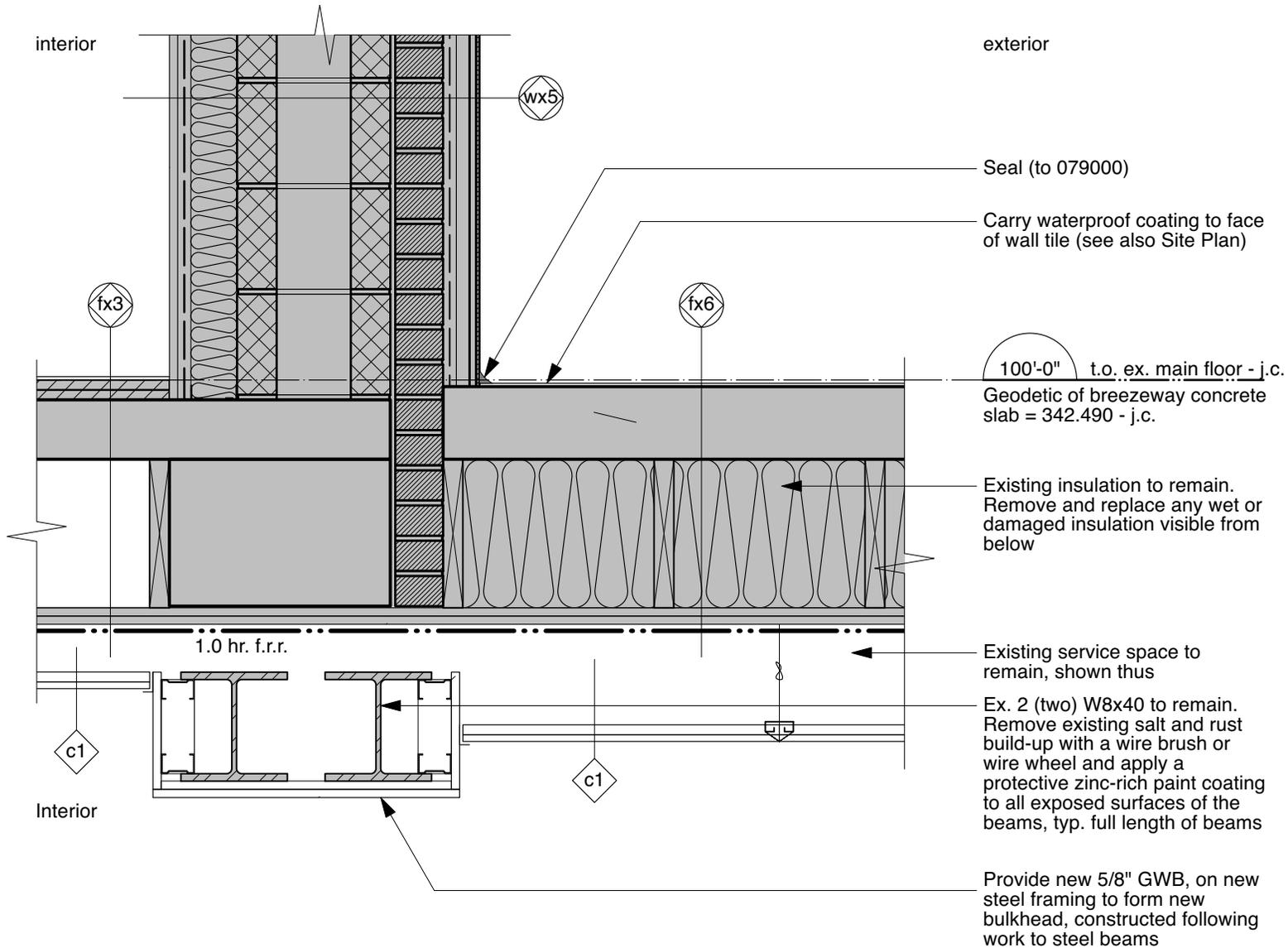
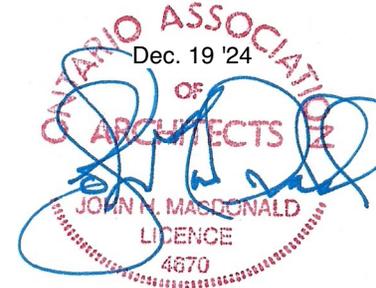
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Seal (to 079000)

Carry waterproof coating to face of wall tile (see also Site Plan)

100'-0" t.o. ex. main floor - j.c.  
Geodetic of breezeway concrete slab = 342.490 - j.c.

Existing insulation to remain. Remove and replace any wet or damaged insulation visible from below

Existing service space to remain, shown thus

Ex. 2 (two) W8x40 to remain. Remove existing salt and rust build-up with a wire brush or wire wheel and apply a protective zinc-rich paint coating to all exposed surfaces of the beams, typ. full length of beams

Provide new 5/8" GWB, on new steel framing to form new bulkhead, constructed following work to steel beams

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No.	Revision	Date	Initial

### Project

RoW - 84 Frederick St.  
Renovation & Renewal  
84 Frederick St.  
Kitchener, ON

Drawing Title	Approved	AD
	Checked	MM
	Drawn	MAM

Section Detail @  
Breezeway South Side

Scale (for 8 1/2x11" printing)	Dwg. No.
1" to 1'-0"	22/B215

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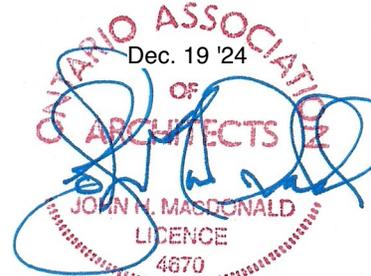
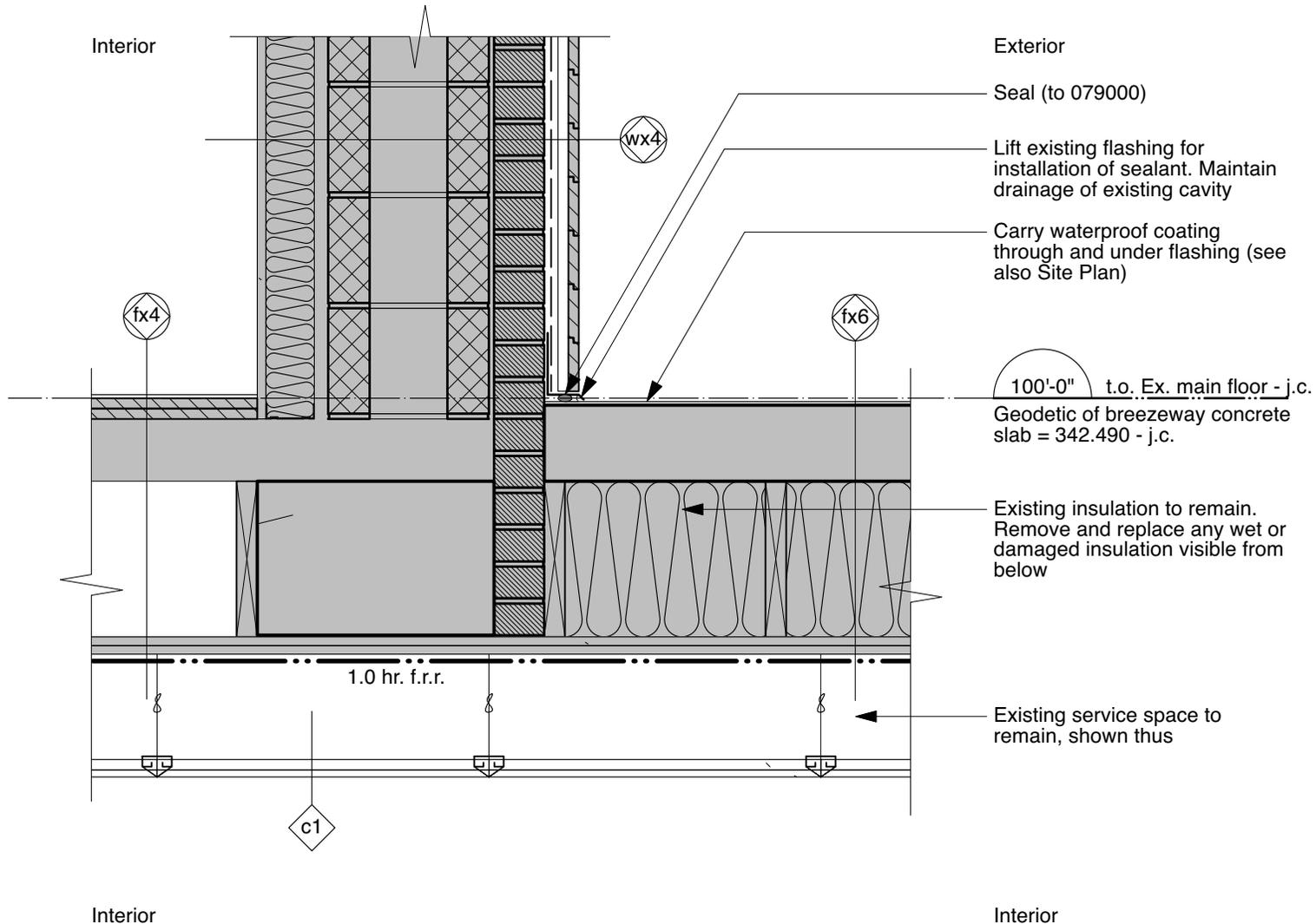
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No.	Revision	Date	Initial

**Project**  
 RoW - 84 Frederick St.  
 Renovation & Renewal  
 84 Frederick St.  
 Kitchener, ON

	Approved	AD
	Checked	MM
Drawing Title	Drawn	MAM

Section Detail @  
 Breezeway North Side

Scale (for 8 1/2x11" printing) | Dwg. No.  
 1" to 1'-0" | 23/B215

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### General Notes:

For Cover and General Notes see Sheet A001  
 For OBC Matrix and Information see Sheet A011  
 For WC Accessories OBC Requirements see Sheet A012  
 For Assembly Types see Sheet A021  
 For Sequence of Construction see Sheet A031  
 For Site Plan see Sheet A121  
 For Floor Plan Removals see A200 series Sheets  
 For Floor Plans see A210 series Sheets  
 For Roof Plan see Sheet A215  
 For Roof Assembly Types see Sheet A215  
 For Floor Finishes Plans see A230 series Sheets  
 For Building Elevations see A300 series Sheets  
 For Window Schedules see Sheet A311  
 For Window Coverings Schedule see Sheet A321  
 For Reflected Ceiling Plans see A500 series Sheets  
 For Ceiling Assembly Types see Sheet A501  
 For Wall Sections see A600 series Sheets  
 For Stair Plans, & Sections see A700 series Sheets  
 For Millwork see A710 series Sheets  
 For Openings Schedules see A800 series Sheets  
 For Room Finishes Schedules see A910 series Sheets  
 For Owner Equipment Schedule see Sheet A921

For Mechanical Drawings see M series Sheets  
 For Electrical Drawings see E series Sheets

Symbol	Description
	supply duct
	return or exhaust duct
	Supply Diffuser Type cfm grille
	R or E Grille Type cfm grille
	acoustic insulation 13mm
	thermal insulation 25mm
	fire damper
	motorized damper
	manual balancing damper
	Return Grille
	Exhaust Grille
	transfer grille
	thermostat
	speed control
	Equipment Identification
	Owner's equipment (see Arch.)

### General Notes to HVAC:

All systems shall be installed in accordance with code requirement, and to ASHRAE and SMACNA standards. All material and equipment shall be new. Ductwork shall be of gauges as outlined by SMACNA standards. Equipment to be as outlined on the drawings and designed by the HVAC Trade Contractor.

**HVAC Equipment:** Select equipment to suit OBC requirements for energy efficiency, and sized to suit the heat/gain/loss (HGHL) calculations prepared by the Owner's qualified HGHL provider. In the absence of such calculations, this mechanical HVAC Trade contractor shall provide such calculations at no additional cost to the Owner.

**HVAC Ductwork:** All ductwork sizing shall be based on HG & HL calculations prepared by HVAC delineation. Obtain copy of HG/HL calculations from Owner.

**Duct Insulation:** Acoustic lining 1/2" (13mm) thick shall be mechanically pinned and glued to the inside of duct work. Thermal insulation shall be 2" (50mm) and be secured to the outside of ductwork. Insulate as shown and at least the first 10 feet (3000mm) from a fan or an outside air connections, including at HRV's. Insulate all ductwork located within attic spaces.

**Ductwork Joints:** Tape to seal all joints in ALL supply and return ductwork. Use purpose made duct tape.

**Floor and ceiling diffusers:** Provide diffusers c/w manual dampening. Colour and style to Owner's selection. All supply grilles to be centered on windows unless specifically noted otherwise.

#### Abbreviations:

R	denotes Return
S	denotes Supply
FA	denotes From Above
TA	denotes To Above
FB	denotes From Below
TB	denotes To Below
FSG	denotes Floor Supply Grille
CSG	denotes Ceiling Supply Grille
WSG	denotes Wall Supply Grille
FRG	denotes Floor Return Grille
CRG	denotes Ceiling Return Grille
WRG	denotes Wall Return Grille

### Gas Piping and Services:

Connect and install new gas piping to requirements of authorities and the gas utilization code.

Provide shut-offs @ all gas-fired devices at accessible locations reviewed and approved by the Owner.

Coordinate with local utility for changes to location of gas supply to the building, and new metering location.

Symbol	Description
	sanitary above slab
	sanitary below slab
	storm above slab
	storm below slab
	cold water
	cold soft water
	hot water
	recirculating hot water
	tempered water
	clean out
	floor drain (75mm u.n.o.)
	hub drain (75mm u.n.o.)
	roof drain
	non-freeze hose bib
	from above
	from below
	to above
	to below
	down to below slab
	water meter
	Equipment Identification
	Removal of existing

### General Notes to Plumbing Plans:

All Work is shown diagrammatic. See also architectural and electrical documents for requirements and coordination with other systems.

All Work to Plumbing Systems shall be undertaken in accordance with OBC Part 7 and best practice.

Not all mechanical requirements are shown. Job check.

Piping insulation not shown. All water distribution piping shall be insulated where copper.

**Venting not shown. Provide all plumbing venting to code.**

#### Abbreviations:

CS	denotes Cold Softened Water
CW	denotes Cold Water
EF	denotes Exhaust Fan
EG	denotes Exhaust Grille
HW	denotes Hot Water
HWH	denotes Hot Water Heater
LV	denotes Lavatory
PR	denotes Perimeter Radiator
RHC	denotes Radiant Heating Cabinet
RTU	denotes Roof Top Unit
SAN	denotes Sanitary
STM	denotes Storm
S or SS	denotes Sink
WC	denotes Water Closet (a.k.a. Toilet)
X or Ex	denotes Existing

Symbol	Description
	length of heating element - feet (0'-0") heating output - MBH (1100 BTUH)
	supply piping
	return piping
	low voltage wiring to T-stats
	thermostat (T-stat)
	zone controller
	Equipment Identification
	from above to below
	from above
	to below
	to below from above
	down to below slab
	denotes existing unit to be made good. Repair minor dents and damage, clean and brush fins.
	denotes existing unit to be removed, refurbish to as new condition, and reinstall. Provide all new missing covers.
	denotes new unit. See also Schedules

### Basic Mechanical Requirements:

The Mechanical Trade Contractors shall incorporate all notes and requirements on Architectural sheet A001 as if repeated here. Include all costs for work described as the responsibility of the Trade Contractor and all other terms and conditions of the Trade Contract as provided by the Owner and/or Contractor or Project Manager.

Furnish and install all materials and equipment as specified and as shown on the drawings for the satisfactory completion of the work.

Test and put into operation all mechanical work. Conform to the applicable requirements of the general conditions of the contract as provided by Owner.

This Trade Contractor, before bidding, shall examine the site and all Documents. It is the contractor's responsibility to be familiar with the Trade complete scope of construction so that the bid includes all that is necessary for the proper completion of the work.

The work of this Trade Contractor includes all trade contractor responsibilities described elsewhere in the Contract and Documents. Examine all documents and include all work to fulfill such responsibilities in the price for the work.

Conform to minimum requirements or better of provincial and local codes and to the requirements of local inspection authorities for the execution of the work.

Obtain permits, pay fees and furnish certificates as evidence that the work installed conforms with the laws and regulations of all governing authorities having jurisdiction.

This Trade contractor shall study the drawings and specifications and shall report any errors or inconsistencies to the Owner before bidding. In no case shall the contractor proceed in uncertainty.

**Shop Drawings:** contractor shall submit shop drawings of equipment and fixtures for Owner's review prior to ordering.

**Cutting and Patching:** include cutting and patching as required for work in this division. All cutting, patching and sleeving shall be located by this trade, including in foundation walls and structure in strict co-ordination with the Contractor or Project Manager.

**Excavating and Backfill:** include excavation and backfill as required for underground piping.

**Sleeves, Access Doors:** provide sleeves and access doors for the installation and servicing of all concealed mechanical equipment. Ensure balancing dampers are accessible in the finished Work.

**Electrical:** This mechanical Trade Contractor shall provide equipment complete with controls. Power wiring to energize mechanical equipment shall be provided by the electrical Trade contractor, but all wiring for controls is provided by this mechanical Trade Contractor.

**Roof Openings:** contractor shall supply all roof openings and counter flashing for mechanical equipment and penetrations for piping and ductwork unless specifically instructed otherwise by the contractor or owner.

**General Work:** concrete pads, furred in duct spaces to be done by the General Contractor or other Trade Contractor unless specifically instructed otherwise. Provide Contractor with list of pad sizes and requirements.

**Guarantee:** guarantee equipment and systems against defects of material and workmanship full year from date of final acceptance. Replace any defective work promptly at no cost to Owner.

Legend of Related Mechanical Abbreviations:	
AD	- Area Drain
AHU	- Air Handling Unit
BH	- Base Board Heater
BD	- Balancing Damper
BDD	- BackDraft Damper
BF	- Barrier-Free
BFP	- BackFlow Preventer
BPD	- By-pass Damper
BTU	- British Thermal Unit
BTUH	- British Thermal Unit per Hour
CB	- Catch Basin
CFD	- Combined Funnel Floor Drain
CFM	- Cubic Feet per Minute
CO	- Clean Out or Carbon Monoxide
CO2	- Carbon Dioxide
CS	- Cold Soft water
CW	- Cold Water
DTBS	- Down To Below Slab
EF	- Exhaust Fan
EG	- Exhaust Grille
EQUIP	- Equipment
ERV	- Energy Recovery Ventilator
ET	- Expansion Tank
EXIST.	- Existing
EXIST.	- Existing
EXH	- Exhaust
FA	- From Above
FB	- From Below
FD	- Fire Damper
FD	- Floor Drain
FDD	- Funnel Floor Drain
FE	- Fire Extinguisher
FEC	- Fire Extinguisher Cabinet
FFH	- Force Flow Heater
FM	- Fire Hose Cabinet
FS	- Forecmain
FS	- Flow Switch
G	- Gas
GA	- Gauge
GAL	- Gallon
GM	- Gas Meter
GV	- Gas Valve
HD	- Hub Drain
HP	- Horse Power
HRV	- Heat Recovery Ventilator
HTR	- Heater
HVAC	- Heating Ventilation & Air Conditioning
HW	- Hot Water or Hand Well
HWH	- Hot Water Heater
KPa	- Kilopascal
LAV	- Lavatory
L	- Litre
L/S	- Litres per Second
MD	- Motorized Damper
MECH	- Mechanical
MS	- Mop Sink
MJA	- Make Up Air
NFHB	- Non-Freeze Hose Bib
NFHH	- Non-Freeze Wall Hydrant
NO2	- Nitrogen Dioxide
OED	- Open Ended Duct
OG	- Pressure Gauge
PRV	- Pressure Reducing Valve
PT	- Pressure Tank
RA	- Return Air
RD	- Roof Drain
RG	- Return Grille
RH	- Radiant Heater
RTU	- Roof Top Unit
RWL	- Rain Water Leader
SA	- Supply Air
SAN	- Sanitary
SD	- Supply Diffuser
SP	- Static Pressure or Sprinkler
SS	- Stainless Steel Sink
STM	- Storm
TA	- To Above
TB	- To Below
TD	- Trench Drain
TEMP	- Temperature
TG	- Transfer Grille
TSTAT	- Thermostat
UIC	- Undercut
VAV	- Variable Air Volume
VENT	- Ventilated, Ventilator or Ventilation
VOL	- Volume
WC	- Washroom or Water Closet
WH	- Wall Hung
WS	- Water Softener
WV	- Water Valve

### List of Mechanical Drawings:

M001	Mechanical General Notes
M101	Basement Plumbing Plan
M102	Ground Floor Plumbing Plan
M103	Second Floor Plumbing Plan
M104	Third Floor Plumbing Plan
M201	Basement Hydronic Heating System Plan
M202	Ground Floor Hydronic Heating System Plan
M203	Second Floor Hydronic Heating System Plan
M204	Third Floor Hydronic Heating System Plan
M301	Basement HVAC Plan
M302	Ground Floor HVAC Plan
M303	Second Floor HVAC Plan
M304	Third Floor HVAC Plan
M305	Roof HVAC Plan

No.	Revision	Date	Initial

## Project

RoW - 84 Frederick St.  
 Renovation & Renewal  
 84 Frederick St  
 Kitchener, ON

	Approved	MB
	Checked	MM
Drawing Title	Drawn	MAM

## Mechanical General Notes

Scale (for 24x36" printing)	Dwg. No.
n/a	M001

M.A. Bryan Engineering Inc.

### General Notes to Cleaning:

Contractor and Mechanical Trade Contractor are cautioned that this Contract requires cleaning to a level required by Region of Waterloo Public Health Authority requirements.

All plumbing fixtures, whether existing or new to be thoroughly and completely cleaned prior to turn over of phased work to the owner. Existing fixtures to be cleaned to as new condition.

Unless specifically noted as by Owner, all existing food service equipment to be commissioned, and thoroughly and completely cleaned prior to turn over of phased work to the owner, to Public Health requirements for food service areas.

### General Notes to Plumbing Plans:

See Division 20 and Sheet M001 for general requirements.

ALL Work is shown diagrammatic. See also architectural and electrical documents for requirements and coordination with other systems.

All Work to Plumbing Systems shall be undertaken in accordance with OBC Part 7 and best practice.

Not all plumbing piping and/or plumbing requirements are shown. Contractor shall review existing conditions, Contract Documents, Reference Documents, all Drawings and Specifications, and cut sheets for all scheduled and specified devices, fixtures and equipment, and shall provide all work described or reasonably inferred.

Piping insulation not shown. All plumbing systems piping shall be insulated, jacketed, and labelled.

Venting not shown. Provide all plumbing venting to code.

Gas distribution piping not shown. Job check all existing gas piping.

All penetrations through rated assemblies shall be fire-stopped. Design of firestopping systems shall be in accordance with firestopping manufacturer's tested assemblies, to meet or exceed assembly rating.

All penetrations through Environmental Separation System shall be sealed and insulated to ensure continuity of thermal & weather barriers.

### Notes to Basement Plumbing Plan:

1 Existing incoming domestic water supply service this location c/w existing back-flow prevention to remain.

2 Existing domestic hot water heaters (two), water softening system equipment, and hot water recirculation pump this location to remain.

3 Rework existing CW, HW, SAN and VENTING to suit new lavatory position. Provide all modifications as may be required.

4 Remove all existing unused SAN plumbing piping complete, to former washroom, shower, and sauna areas and adjacent Storage Rooms. Prior to piping removal, Plumbing Trade Contractor shall trace all piping to confirm any connections to equipment or intake devices, and shall report to Consultant. Where no connections or intake proceed to removal. Where equipment or intake devices are connected to such piping, maintain only those portions of existing piping required, and provide all modifications. See also Architectural removals plans and floor plans.

5 Connect new floor drain SAN piping to existing. Repair existing leaks in piping in ceilings this area. See also Architectural removals and RCPs.

### Plumbing Legend:

Symbol	Description
—S1—	sanitary above slab
—SAN—	sanitary below slab
—STM—	storm above slab
—STM—	storm below slab
—CW—	cold water
—CSW—	cold soft water
—HW—	hot water
—HWR—	recirculating hot water
—TW—	tempered water
—CO—	clean out
—FD—	floor drain (75mm u.n.o.)
—HD—	hub drain (75mm u.n.o.)
—RD—	roof drain
—NFHB—	non-freeze hose bib
—FA—	from above
—FB—	from below
—TA—	to above
—TB—	to below
—DTBS—	down to below slab
—(M)—	water meter
WC-1	Equipment Identification
////	Removal of existing

### Plumbing Fixture & Equipment Schedule (See Also Section 224200):

Type	Fixture	Description	CW	CS	HW	TW	SAN	VENT	Remarks
WC-X1	Existing Water Closet	Existing to remain. Remove and reinstall following completion of flooring installations	1/2" (13mm)	-	-	-	3" (75mm)	1 1/2" (38mm)	Disconnect and reconnect. Replace existing shut-offs with new tamper-proof shut-offs with stop and escutcheon. Provide all piping modifications to suit.
WC-1	Water Closet Floor Mount (Tank)	American Standard Cadet Pro 215CA-054, Elongated, white, rough-in to suit existing SAN, c/w Tank 4188A.174 with aquaguard liner and tank cover locking device. Trip level to be coordinated to be on open side of toilet.	1/2" (13mm)	-	-	-	3" (75mm)	1 1/2" (38mm)	Maximum 6 litres/flush (1.6 GPF). Provide c/w cover, escutcheon, tamper-proof supply with stop.
WC-2	Water Closet Floor Mount (Tank) Barrier-Free	American Standard Cadet Pro 215AA-054 Right Height, Elongated, white, rough-in to suit existing SAN, 16.5" rim height, c/w Tank 4188A.174 with aquaguard liner and tank cover locking device. Trip level to be coordinated to be on open side of toilet.	1/2" (13mm)	-	-	-	3" (75mm)	1 1/2" (38mm)	Maximum 6 litres/flush (1.6 GPF). Provide c/w cover, escutcheon, tamper-proof supply with stop.
L-X1	Existing Wall-Hung Lavatory	Existing lavatory to remain. Existing trim to remain. Replace existing shut-offs with vandal resistant type. Provide all modifications to plumbing as req'd.	Ex. 1/2" (13mm)	-	-	-	Ex. 1 1/4" (32mm)	Ex. 1 1/4" (32mm)	Tighten all wall carriers and level lavatories. Make good all existing sealant (to 07900). Repair all piping leaks. Job Check existing.
L-X2	Existing Wall-Hung Lavatory (BF)	Existing lavatory to remain. Existing trim to remain. Replace existing shut-offs with vandal resistant type. Provide all modifications to plumbing as req'd.	Ex. 1/2" (13mm)	-	-	-	Ex. 1 1/4" (32mm)	Ex. 1 1/4" (32mm)	Tighten all wall carriers and level lavatories. Make good all existing sealant (to 07900). Repair all piping leaks. Job Check existing. Provide new pipe shroud.
L-1	New Wall-Hung Lavatory	American Standard Lucerne 0355-012, White, Delta Commercial Teck heavy-duty vandal resistant Metering Handwash faucet 871105, vandal-resistant flow-control spray outlet, c/w offset trap, supplies with stops, escutcheons, wats WCA-411 Floor-mount carrier.	Ex. 1/2" (13mm)	-	-	Ex. 1/2" (13mm)	Ex. 1 1/4" (32mm)	Ex. 1 1/4" (32mm)	Maximum 1.9 litres/minute (0.5 GPM)
L-2	New Wall-Hung Lavatory (BF)	American Standard Murro 0954-004EC, White, 0959-020 EC China shroud, Delta Commercial Teck heavy-duty vandal resistant Metering Handwash faucet 871105, vandal-resistant flow-control spray outlet, WCA-411 Floor-mount carrier.	1/2" (13mm)	-	-	1/2" (13mm)	1 1/2" (38mm)	1 1/4" (32mm)	Maximum 1.9 litres/minute (0.5 GPM)
L-3	New Semi-countertop Lavatory	American Standard Mezzo 9960.001, White, Delta Commercial Teck heavy-duty vandal resistant Metering Handwash faucet 871105, vandal-resistant flow-control spray outlet. Steel mounting brackets to rear and side of unit.	1/2" (13mm)	-	-	1/2" (13mm)	1 1/2" (38mm)	1 1/4" (32mm)	Maximum 1.9 litres/minute (0.5 GPM)
SS-X1	Ex. Single Compartment Sink to Remain u.n.o.	Existing Stainless Steel Sink. Provide new trim: Delta Commercial 100LF-HDF Chrome, Flow restrictor c/w trap, supplies with stops, escutcheons, crumb cup strainer.	1/2" (13mm)	-	1/2" (13mm)	-	1 1/2" (38mm)	1 1/4" (32mm)	Job check existing bowl dimensions. Provide new tamper-proof shut-offs.
SS-X2	Ex. Double Compartment Sink to Remain u.n.o.	Existing Stainless Steel Sink. Provide new trim: Delta Commercial 100LF-HDF Chrome, Flow restrictor c/w trap, supplies with stops, escutcheons, crumb cup strainer.	1/2" (13mm)	-	1/2" (13mm)	-	1 1/2" (38mm)	1 1/4" (32mm)	Job check existing bowl dimensions. Provide new tamper-proof shut-offs.
SS-1	New Single Compartment Sink	Franke Commercial ALBS1305P-1/2 single compartment 18 gauge stainless steel with ledge, Delta Commercial 100LF-HDF Chrome, Flow restrictor c/w trap, supplies with stops, escutcheons, crumb cup strainer.	1/2" (13mm)	-	1/2" (13mm)	-	1 1/2" (38mm)	1 1/4" (32mm)	Maximum 8.35 Litres/minute (2.2 GPM) double compartment (1' 11" x 13' x 5')
SS-2	New Double Compartment Sink	Franke Commercial LBD6408P-1/3 double compartment 18 gauge stainless steel with ledge, Delta Commercial 100LF-HDF Chrome, Flow restrictor c/w trap, supplies with stops, escutcheons, crumb cup strainer.	1/2" (13mm)	-	1/2" (13mm)	-	1 1/2" (38mm)	1 1/4" (32mm)	Maximum 8.25 Litres/minute (2.2 GPM) single compartment (2' 11" x 13' x 5' deep bowl. Provide c/w thermostatic mixing valve.
SH-X	Existing Shower to remain. New trim	Existing shower to remain. Clean to as new condition. Provide new heavy-duty, vandal resistant manual push button controls and thermostatic mixing valve to replace existing lever controls and valve. Provide new handheld shower head, slide bar, 7' (1.800mm) long flexible hose, and adjustable bar. See also Section 224000.	Ex. 1/2" (13mm)	-	Ex. 1/2" (13mm)	-	Ex. 2" (50mm)	Ex. 1 1/2" (38mm)	Provide all modifications to existing plumbing, wallboard and finishes as may be required to suit new trim.
SH-1	New Shower	Enclosure: new 30"W x 60"L x 84"H (765mm x 1525mm x 2134mm) one-piece, heavy-duty, pre-fabricated shower enclosure. Longevity, to suit existing recess dimensions. CW trap, and shower drain, chrome, Symmons 4-420 metering shower valve and trim kit + WATTS 1170LF mixing valve. Wall-mounted, 1.75 GPM shower head, chrome, integral stops. See also Section 224000.	Ex. 1/2" (13mm)	-	Ex. 1/2" (13mm)	-	Ex. 2" (50mm)	Ex. 1 1/2" (38mm)	Maximum 7.6 Litres/minute (2GPM). Modify all existing water and SAN plumbing to suit new enclosure and trim. Coordinate with Wallboard Trade Contractor for all modifications to enclosure recess as may be required. Seal all enclosure penetrations.
SH-2	New Shower	Enclosure: new 36"W x 48"L by 84"H (915mm x 1220mm x 2134mm) one-piece, heavy-duty, pre-fabricated shower enclosure. Longevity, to suit existing recess dimensions. CW trap, and shower drain, chrome, Symmons 4-420 metering shower valve and trim kit + WATTS 1170LF mixing valve. Wall-mounted, 1.75 GPM shower head, chrome, integral stops. See also Section 224000.	Ex. 1/2" (13mm)	-	Ex. 1/2" (13mm)	-	Ex. 2" (50mm)	Ex. 1 1/2" (38mm)	Maximum 7.6 Litres/minute (2GPM). Modify all existing water and SAN plumbing to suit new enclosure and trim. Coordinate with Wallboard Trade Contractor for all modifications to enclosure recess as may be required. Seal all enclosure penetrations.
SH-3	New Shower (Accessible)	Enclosure: new 36"W x 60"L by 84"H (915mm x 1525mm x 2134mm) one-piece, heavy-duty, pre-fabricated, barrier-free leading edge, shower enclosure. Longevity, to suit existing recess dimensions. CW trap, and shower drain, chrome, Symmons 4-420 metering shower valve and trim kit + WATTS 1170LF mixing valve. 1.5GPM handheld shower head, 72"L (1800mm) flexible stainless steel hose, and 36" (915mm) adjustable slide bar, chrome, integral stops. See also Section 224000.	Ex. 1/2" (13mm)	-	Ex. 1/2" (13mm)	-	Ex. 2" (50mm)	Ex. 1 1/2" (38mm)	Maximum 7.6 Litres/minute (2GPM). Modify all existing water and SAN plumbing to suit new enclosure and trim. Coordinate with Wallboard Trade Contractor for all modifications to enclosure recess as may be required. Seal all enclosure penetrations.
SH-4	New Shower (Barrier-Free)	Enclosure: new 36.5"W x 66"L by 84"H (927mm x 1676mm x 2134mm) one-piece, heavy-duty, pre-fabricated, barrier-free leading edge, shower enclosure. Minimum clear internal dimension of 36"W x 60"L (915mm x 1525mm) Longevity SC2366 OBC 2 Bar Phenolic Seal. CW trap, and shower drain, chrome, Symmons lever shower valve and trim kit + WATTS 1170LF mixing valve. 1.5GPM handheld shower head, 72"L (1800mm) flexible stainless steel hose, and 36" (915mm) adjustable slide bar, chrome, integral stops. See also Section 224000.	1/2" (13mm)	-	1/2" (13mm)	-	2" (50mm)	1 1/2" (38mm)	Maximum 7.6 Litres/minute (2GPM). Extend existing hot water and cold water supplies, and SAN piping from nearest existing adjacent plumbing to new shower enclosure and trim.
MS-X	Existing Mop Sink to Remain u.n.o.	Existing mop sink to remain.	Ex. 1/2" (13mm)	-	Ex. 1/2" (13mm)	-	Ex. 3" (75mm)	Ex. 1 1/2" (38mm)	Replace existing tamper-proof shut-offs with new.
MS-1	New Mop Sink	Fiat MSB 2424, Delta 2819, Wall Brace, vacuum Breaker, FIAT MSC4x24(2) wall guards with corner bracket. CW trap, integral stops	Ex. 1/2" (13mm)	-	Ex. 1/2" (13mm)	-	Ex. 3" (75mm)	Ex. 1 1/2" (38mm)	Provide stainless steel splash panels to back and side walls of mop sink.
EW-1	New Emergency Eyewash	Haws 74608T complete with mixing valve with temperature gauge.	1/2" (13mm)	-	1/2" (13mm)	-	1 1/4" (32mm)	N/A	Pipe sanitary to spill to adjacent mop sink.
WB-1	New Machine Machine Wall Outlet Box	Oatey Quadro c/w tamper-proof valves, braided flex hoses, drain, fac plate	1/2" (13mm)	-	1/2" (13mm)	-	2" (50mm)	1/2" (38mm)	Pipe sanitary to spill to adjacent mop sink.
HS-X	Existing Handwash Sink	Existing Handwash Sink to remain. Provide new faucet and trim: Delta Commercial 100LF-HDF Chrome, Flow restrictor c/w trap, supplies with stops, escutcheons, crumb cup strainer.	Ex. 1/2" (13mm)	-	Ex. 1/2" (13mm)	-	Ex. 3" (75mm)	Ex. 1 1/2" (38mm)	Tighten all wall carriers and level hand wash sinks. Make good all existing sealant (to 07900). Repair all piping leaks. Replace existing shut-offs with new tamper-proof shut-offs.

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This document is to be read together with all other documents issued for the specific purpose noted, and all other documents further referenced therein.

This document is not to be scaled for dimensions. Where dimensions are not noted or the relation of portions of the work are not immediately apparent, the reader shall not proceed in uncertainty.

The reader shall immediately notify the Architect of all inconsistencies, errors, or omissions which they may discover in this or other documents, or in their relation in whole or in part.



No.	Issued for Purpose	Date	Initial
1	Subconsultant Review	Nov 25 '24	MM
2	30% Check Set	Dec 05 '24	MM
3	90% Check Set	Dec 12 '24	MM
T	For Tender	Dec 19 '24	MM

### General Notes:

For Cover and General Notes see Sheet A001  
 For OBC Matrix and Information see Sheet A011  
 For WC Accessories OBC Requirements see Sheet A012  
 For Assembly Types see Sheet A021  
 For Sequence of Construction see Sheet A031  
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 For Ceiling Assembly Types see Sheet A501  
 For Wall Sections see A600 series Sheets  
 For Stair Plans, & Sections see A700 series Sheets  
 For Stairwork see A710 series Sheets  
 For Openings Schedules see A800 series Sheets  
 For Room Finishes Schedules see A910 series Sheets  
 For Owner Equipment Schedule see Sheet A921

For Mechanical Drawings see M series Sheets  
 For Electrical Drawings see E series Sheets



No.	Revision	Date	Initial

**Project**  
 RoW - 84 Frederick St.  
 Renovation & Renewal  
 84 Frederick St  
 Kitchener, ON

Drawing Title	Approved	Checked	Drawn
Basement Plumbing Plan	MAB	MM	MAM

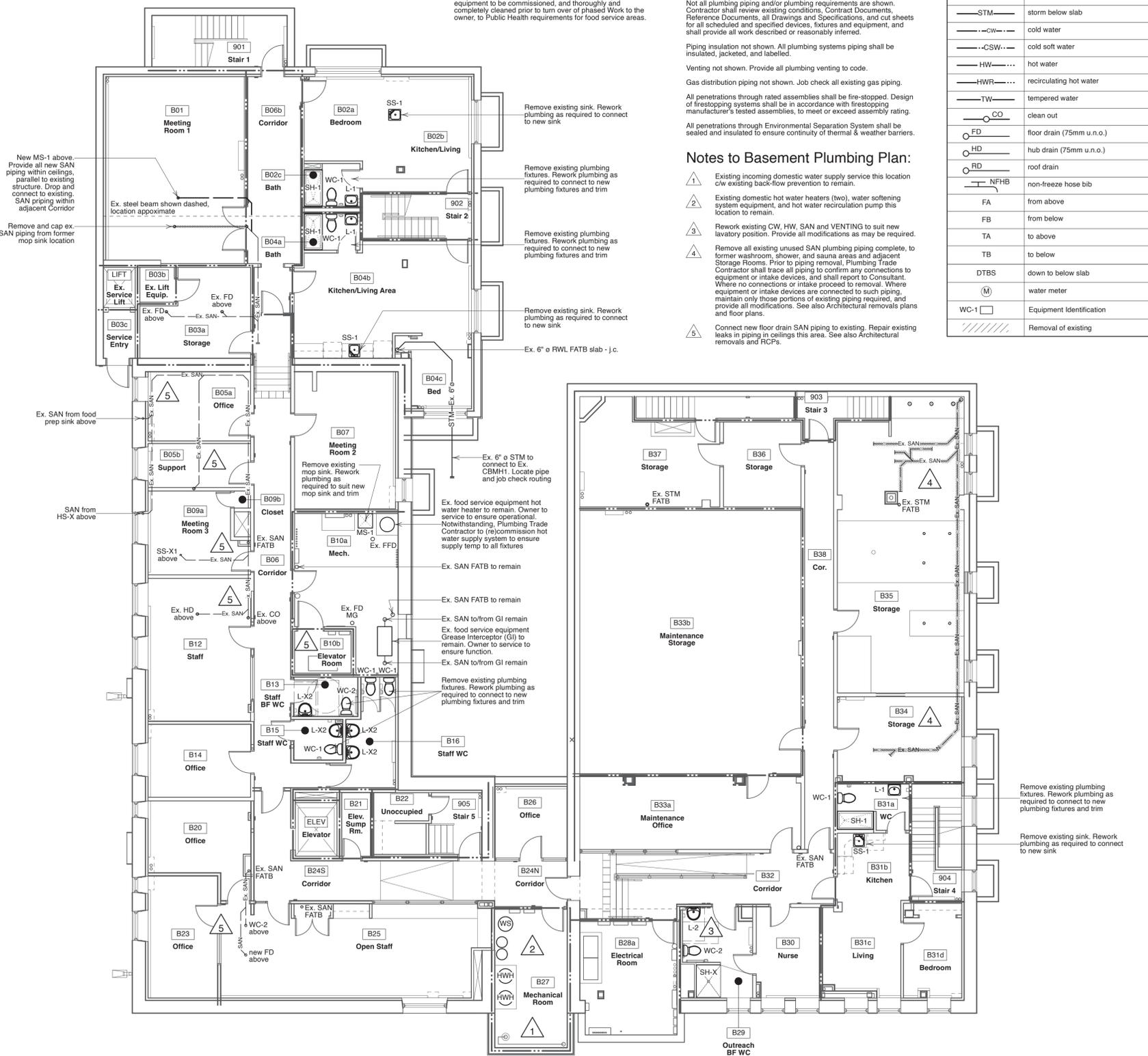
**Basement Plumbing Plan**

Scale (for 24x36" printing) Dwg. No.

1/8" = 1'-0" M101

M.A. Bryan Engineering Inc.

285 Weber Street North, Unit B1, Waterloo, ON N2J 3H8  
 mark@mabryan.com (519) 489-2674



1 Basement Plumbing Plan  
 M101 1/8" = 1'-0"



Plumbing Legend:	
Symbol	Description
—S1—	sanitary above slab
—SAN—	sanitary below slab
—STM—	storm above slab
—STM—	storm below slab
—CW—	cold water
—CSW—	cold soft water
—HW—	hot water
—HWR—	recirculating hot water
—TW—	tempered water
—CO—	clean out
—FD—	floor drain (75mm u.n.o.)
—HD—	hub drain (75mm u.n.o.)
—RD—	roof drain
—NFHB—	non-freeze hose bib
FA	from above
FB	from below
TA	to above
TB	to below
DTBS	down to below slab
(M)	water meter
WC-1	Equipment Identification
////	Removal of existing

**General Notes to Plumbing Plans:**

See Division 20 and Sheet M001 for general requirements.

ALL Work is shown diagrammatic. See also architectural and electrical documents for requirements and coordination with other systems.

All Work to Plumbing Systems shall be undertaken in accordance with OBC Part 7 and best practice.

Not all plumbing piping and/or plumbing requirements are shown. Contractor shall review existing conditions, Contract Documents, Reference Documents, all Drawings and Specifications, and cut sheets for all scheduled and specified devices, fixtures and equipment, and shall provide all work described or reasonably inferred.

Piping insulation not shown. All plumbing systems piping shall be insulated, jacketed, and labeled.

Venting not shown. Provide all plumbing venting to code.

Gas distribution piping not shown. Job check all existing gas piping.

All penetrations through rated assemblies shall be fire-stopped. Design of firestopping systems shall be in accordance with firestopping manufacturer's tested assemblies, to meet or exceed assembly rating.

All penetrations through Environmental Separation System shall be sealed and insulated to ensure continuity of thermal & weather barriers.

**General Notes to Cleaning:**

Contractor and Mechanical Trade Contractor are cautioned that this Contract requires cleaning to a level required by Region of Waterloo Public Health Authority requirements.

All plumbing fixtures, whether existing or new to be thoroughly and completely cleaned prior to turn over of phased Work to the owner. Existing fixtures to be cleaned to as new condition.

Unless specifically noted as by Owner, all existing food service equipment to be commissioned, and thoroughly and completely cleaned prior to turn over of phased Work to the owner, to Public Health requirements for food service areas.

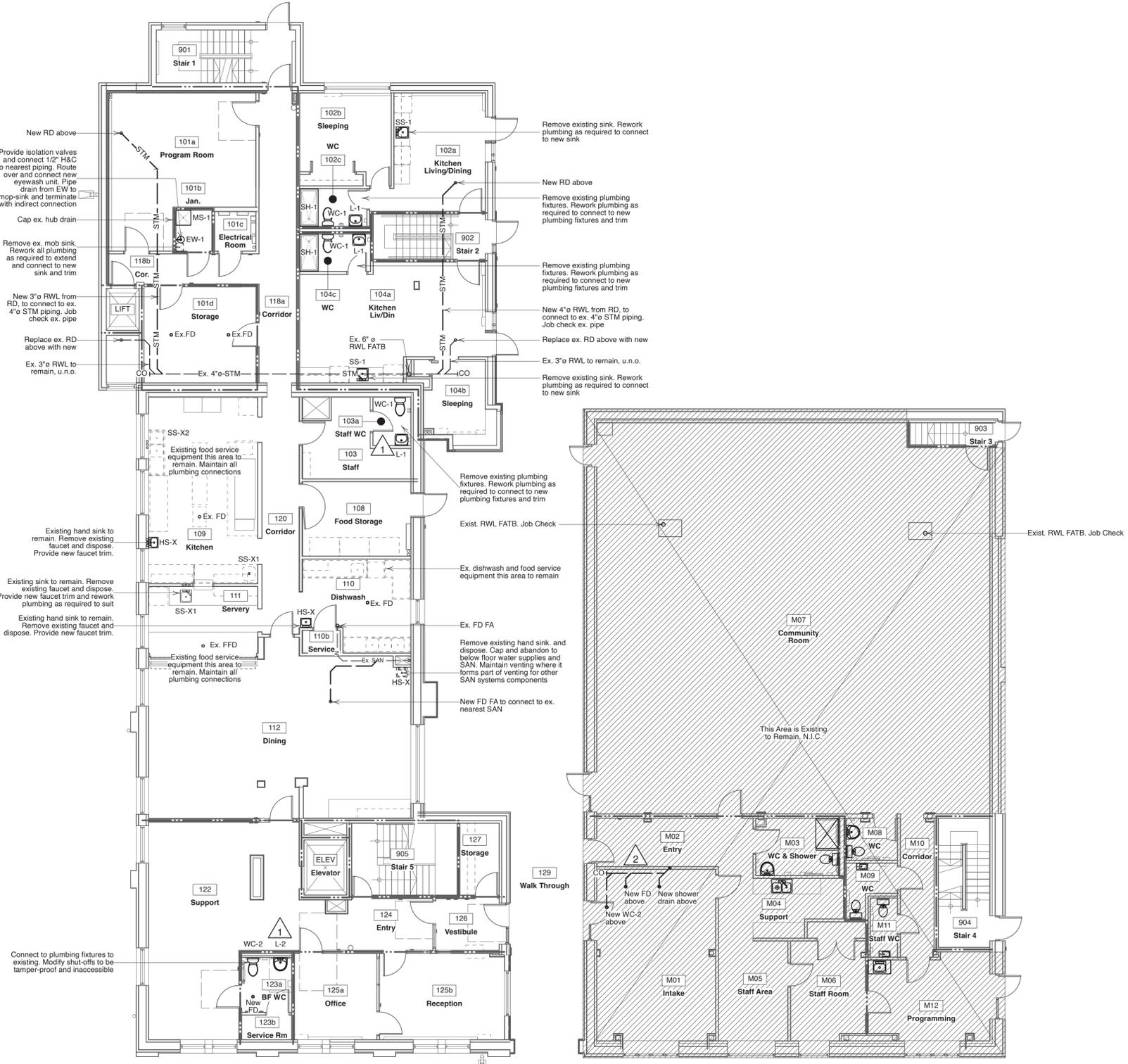
**Notes to Main Floor Plumbing Plan:**

- 1 Rework existing CW, HW, SAN and VENTING to suit new lavatory position. Provide all modifications as may be required.
- 2 Provide all new plumbing to suit new and repositioned plumbing fixtures in barrier-free bathroom above. Perform work in strict coordination with Owner's occupied areas and at times instructed by Owner. Location of vertical SAN line FATB shown approximate. Job check location and adjust piping runs to suit. Coordinate with existing Mechanical exhaust ductwork crossing within ceilings this location. See also HVAC Plans. Coordinate plumbing with existing LAP ceilings and all services within such ceilings and ensure all plumbing is routed above ceilings. All such Work is included in the Contract Price.

No.	Issued For Purpose	Date	Initial
1	SubConsultant Review	Nov. 25 '24	MM
2	30% Check Set	Dec. 05 '24	MM
3	90% Check Set	Dec. 12 '24	MM
T	For Tender	Dec. 19 '24	MM

**General Notes:**

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 For Window Coverings Schedule see Sheet A321  
 For Reflected Ceiling Plans see A500 series Sheets  
 For Ceiling Assembly Types see Sheet A501  
 For Wall Sections see A600 series Sheets  
 For Stair Plans, & Sections see A700 series Sheets  
 For Millwork see A710 series Sheets  
 For Openings Schedules see A800 series Sheets  
 For Room Finishes Schedules see A910 series Sheets  
 For Owner Equipment Schedule see Sheet A921  
 For Mechanical Drawings see M series Sheets  
 For Electrical Drawings see E series Sheets



1 Ground Floor Plumbing Plan  
 M102 1/8" = 1'-0"

No.	Revision	Date	Initial
Project			
RoW - 84 Frederick St. Renovation & Renewal			
84 Frederick St Kitchener, ON			
Drawing Title			Approved MAB
Ground Floor Plumbing Plan			Checked MM
Scale (for 24x36" printing)			Drawn MAM
1/8" = 1'-0"			Dwg. No.
			M102
M.A. Bryan Engineering Inc.			



Plumbing Legend:	
Symbol	Description
—S1—	sanitary above slab
—SAN—	sanitary below slab
—STM—	storm above slab
—STM—	storm below slab
—CW—	cold water
—CSW—	cold soft water
—HW—	hot water
—HWR—	recirculating hot water
—TW—	tempered water
—CO—	clean out
—FD—	floor drain (75mm u.n.o.)
—HD—	hub drain (75mm u.n.o.)
—RD—	roof drain
—NFHB—	non-freeze hose bib
FA	from above
FB	from below
TA	to above
TB	to below
DTBS	down to below slab
(M)	water meter
WC-1	Equipment Identification
////	Removal of existing

No.	Issued For Purpose	Date	Initial
1	SubConsultant Review	Nov. 25 '24	MM
2	30% Check Set	Dec. 05 '24	MM
3	90% Check Set	Dec. 12 '24	MM
T	For Tender	Dec. 19 '24	MM

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 For Stair Plans, & Sections see A700 series Sheets  
 For Millwork see A710 series Sheets  
 For Openings Schedules see A900 series Sheets  
 For Room Finishes Schedules see A910 series Sheets  
 For Owner Equipment Schedule see Sheet A921



**General Notes to Plumbing Plans:**

See Division 20 and Sheet M001 for general requirements.  
 ALL Work is shown diagrammatic. See also architectural and electrical documents for requirements and coordination with other systems.  
 All Work to Plumbing Systems shall be undertaken in accordance with OBC Part 7 and best practice.  
 Not all plumbing piping and/or plumbing requirements are shown. Contractor shall review existing conditions, Contract Documents, Reference Documents, all Drawings and Specifications, and cut sheets for all scheduled and specified devices, fixtures and equipment, and shall provide all work described or reasonably inferred.  
 Piping insulation not shown. All plumbing systems piping shall be insulated, jacketed, and labeled.  
 Venting not shown. Provide all plumbing venting to code.  
 Gas distribution piping not shown. Job check all existing gas piping.  
 All penetrations through rated assemblies shall be fire-stopped. Design of firestopping systems shall be in accordance with firestopping manufacturer's tested assemblies, to meet or exceed assembly rating.  
 All penetrations through Environmental Separation System shall be sealed and insulated to ensure continuity of thermal & weather barriers.

**General Notes to Cleaning:**

Contractor and Mechanical Trade Contractor are cautioned that this Contract requires cleaning to a level required by Region of Waterloo Public Health Authority requirements.  
 All plumbing fixtures, whether existing or new to be thoroughly and completely cleaned prior to turn over of phased Work to the owner. Existing fixtures to be cleaned to as new condition.  
 Unless specifically noted as by Owner, all existing food service equipment to be commissioned, and thoroughly and completely cleaned prior to turn over of phased Work to the owner, to Public Health requirements for food service areas.

**Notes to Second Floor Plumbing Plan:**

- 1 Rework existing CW, HW, SAN and VENTING to suit new lavatory position. Provide all modifications as may be required.
- 2 Provide new floor drain in location, c/w all trap and SAN piping down to ceiling space of main floor areas below. Extend and connect SAN piping to nearest adjacent SAN piping. Provide all modifications to suit.
- 3 Route water supplies to Lavatory and shower controls, and SAN from Lavatory above floor, within adjacent partition.

**Project**

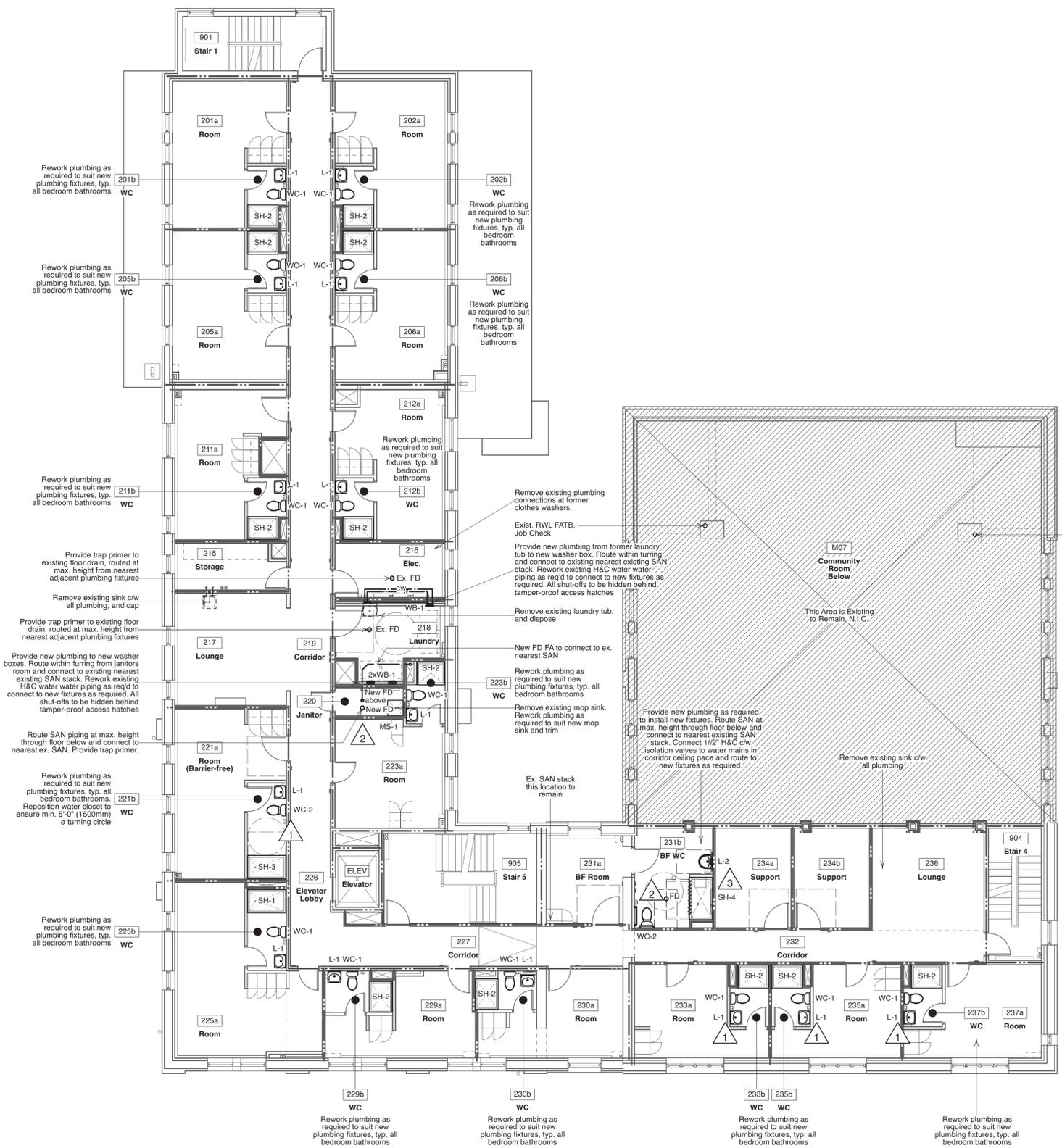
RoW - 84 Frederick St.  
 Renovation & Renewal  
 84 Frederick St  
 Kitchener, ON

Approved	MAB
Checked	MM
Drawing Title	Drawn MAM

**Second Floor Plumbing Plan**

Scale (for 24x36" printing) Dwg. No.  
 1/8" = 1'-0" M103

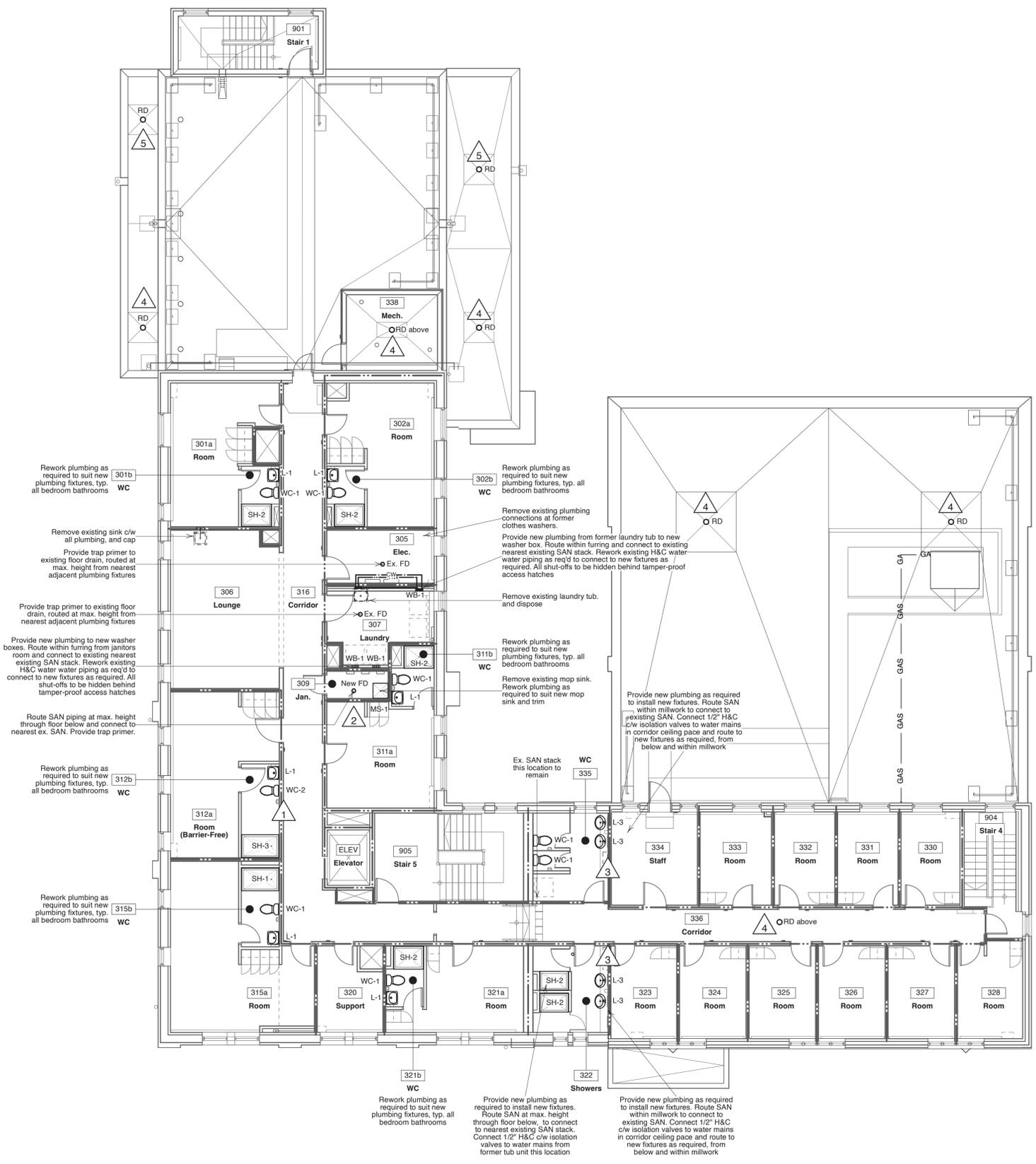
M.A. Bryan Engineering Inc.



1 Second Floor Plumbing Plan  
 M103 1/8" = 1'-0"



Plumbing Legend:	
Symbol	Description
—S1—	sanitary above slab
—SAN—	sanitary below slab
—STM—	storm above slab
—STM—	storm below slab
—CW—	cold water
—CSW—	cold soft water
—HW—	hot water
—HWR—	recirculating hot water
—TW—	tempered water
—CO—	clean out
○FD	floor drain (75mm u.n.o.)
○HD	hub drain (75mm u.n.o.)
○RD	roof drain
—NFHB	non-freeze hose bib
FA	from above
FB	from below
TA	to above
TB	to below
DTBS	down to below slab
(M)	water meter
WC-1	Equipment Identification
////	Removal of existing



**General Notes to Plumbing Plans:**

See Division 20 and Sheet M001 for general requirements.

All Work is shown diagrammatic. See also architectural and electrical documents for requirements and coordination with other systems.

All Work to Plumbing Systems shall be undertaken in accordance with OBC Part 7 and best practice.

Not all plumbing piping and/or plumbing requirements are shown. Contractor shall review existing conditions, Contract Documents, Reference Documents, all Drawings and Specifications, and cut sheets for all scheduled and specified devices, fixtures and equipment, and shall provide all work described or reasonably inferred.

Piping insulation not shown. All plumbing systems piping shall be insulated, jacketed, and labeled.

Venting not shown. Provide all plumbing venting to code.

Gas distribution piping not shown. Job check all existing gas piping.

All penetrations through rated assemblies shall be fire-stopped. Design of firestopping systems shall be in accordance with firestopping manufacturer's tested assemblies, to meet or exceed assembly rating.

All penetrations through Environmental Separation System shall be sealed and insulated to ensure continuity of thermal & weather barriers.

**General Notes to Cleaning:**

Contractor and Mechanical Trade Contractor are cautioned that this Contract requires cleaning to a level required by Region of Waterloo Public Health Authority requirements.

All plumbing fixtures, whether existing or new to be thoroughly and completely cleaned prior to turn over of phased Work to the owner. Existing fixtures to be cleaned to as new condition.

Unless specifically noted as by Owner, all existing food service equipment to be commissioned, and thoroughly and completely cleaned prior to turn over of phased Work to the owner, to Public Health requirements for food service areas.

**Notes to Third Floor Plumbing Plan:**

- 1 Rework existing CW, HW, SAN and VENTING to suit new lavatory position. Provide all modifications as may be required.
- 2 Provide new floor drain in this location, c/w all trap and SAN piping down to ceiling space of main floor areas below. Extend and connect SAN piping to nearest adjacent SAN piping. Provide all modifications as suit.
- 3 Route plumbing tail from Lavatories within millwork chase above floor. Connect to existing.
- 4 Existing roof drain to be disconnected, removed and replaced with new roof drain. Mechanical Trade Contractor to Supply roof drain to Roofing Trade Contractor for installation. Coordinate with existing STM piping.
- 5 New roof drain in this location. Mechanical Trade Contractor to Supply roof drain to Roofing Trade Contractor for installation. Provide all new STM piping and connections.

No.	Issued for Purpose	Date	Initial
1	SubConsultant Review	Nov. 25 '24	MM
2	30% Check Set	Dec. 05 '24	MM
3	90% Check Set	Dec. 12 '24	MM
T	For Tender	Dec. 19 '24	MM

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 For Millwork see A710 series Sheets  
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 For Room Finishes Schedules see A910 series Sheets  
 For Owner Equipment Schedule see Sheet A921

For Mechanical Drawings see M series Sheets  
 For Electrical Drawings see E series Sheets



No.	Revision	Date	Initial

**Project**  
 RoW - 84 Frederick St.  
 Renovation & Renewal  
 84 Frederick St  
 Kitchener, ON

Approved	MAB
Checked	MM
Drawing Title	Drawn MAM

**Third Floor Plumbing Plan**

Scale (for 24x36" printing) Dwg. No.  
 1/8" = 1'-0" M104

M.A. Bryan Engineering Inc.

1 Third Floor Plumbing Plan  
 M104 1/8" = 1'-0"

### Notes to Basement Hydronic Heating System Plan:

Remove existing jacketing and insulation and dispose. Repair hydronic piping leaks, top both supply and return pipes. Provide new pipe insulation, jacketing and markings.

### General Notes to Hydronic Heating System Plans:

See also Division 01 requirements.  
See also Sections 200500 and 200501.  
Responsibility for Hydronic Heating Building System rests with the Mechanical Trade Contractor.  
Prior to start of the work, test all systems components to verify function. Report findings to Owner and Consultant.  
Not all hydronic heating system piping is shown. Confirm all piping, including liquid and suction lines.  
Job check all existing conditions.  
Fire-stop all penetrations through fire separations and all assemblies having a fire resistance rating. See also Architectural Documents for extent of separations and ratings. Firestop all penetrations whether existing or new.  
Insulate all hydronic heating system piping. Where existing piping is found to be uninsulated, provide insulation.

### General Notes to Hydronic Systems:

All systems shall be installed in accordance with code requirement, and to ashrac and hydronic institute standards. All material and equipment shall be new. Equipment to be as outlined on the drawings.  
Hydronic piping: all new piping shall type k copper conforming astm b88m.  
Provide and install all necessary isolation valves, unions, drain/fill valves, etc. To allow isolation of equipment/strainers/filters for performing regular maintenance and as recommended by the equipment manufacturer installation instructions.  
Provide and install automatic air vents at any location where air can be trapped due to piping arrangements. Automatic air vents to be installed with isolation valve.  
Install equipment and accessories in accessible locations. Where concealed, provide suitably sized access panel(s) to allow maintenance personnel to be able to reach and service equipment without obstruction.  
Pipe insulation:  
The following insulation thicknesses shall be applied to all hydronic pipes based on system temperatures and pipe sizes:  
Temperature: pipe size: thickness:  
Heating (<140°F) 1-1/4" (32mm) or smaller 1" (25mm)  
Heating (<140°F) 1-1/2" (38mm) or larger 1-1/2" (38mm)  
Heating (141°F-200°F) 1-1/4" (32mm) or smaller 1-1/2" (38mm)  
Heating (141°F-200°F) 1-1/2" (38mm) or larger 2" (50mm)  
PVC jacket shall be applied to visible insulated pipes (ie open ceiling, mechanical rooms, etc).  
Contractor to hydrostatically test system prior to cleaning. Contractor to include water treatment system c/w chemical feeder and by-pass filter as required.  
Hydronic systems are to be tested and balanced by contractor. Balance water systems to within plus or minus 5% of design output. Submit copy of testing and balancing report to Mechanical Engineering Consultant for review and acceptance.

### Hydronic Systems Legend:

Symbol	Description
BB-10 1.1	Heating Equipment Tag length of heating element - feet (10'-0") heating output - MBH (100 BTUH)
---	supply piping
---	return piping
----	low voltage wiring to T-stats
⊖	thermostat (T-stat)
⊙	zone controller
⊗	Equipment Identification
FATB	from above to below
FA	from above
TB	to below
TBFA	to below from above
DTBS	down to below slab
MG	denotes existing unit to be made good. Repair minor dents and damage, clean and brush fins.
Refurbish	denotes existing unit to be removed, refurbish to as new condition, and reinstall. Provide all new missing covers.
New	denotes new unit. See also Schedules

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2	30% Check Set	Dec. 05 '24	MM
3	90% Check Set	Dec. 12 '24	MM
T	For Tender	Dec. 19 '24	MM

### General Notes:

For Cover and General Notes see Sheet A001  
For OBC Matrix and Information see Sheet A011  
For WC Accessories OBC Requirements see Sheet A012  
For Assembly Types see Sheet A021  
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For Mechanical Drawings see M series Sheets  
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Project North

No.	Revision	Date	Initial

**Project**  
RoW - 84 Frederick St.  
Renovation & Renewal  
84 Frederick St  
Kitchener, ON

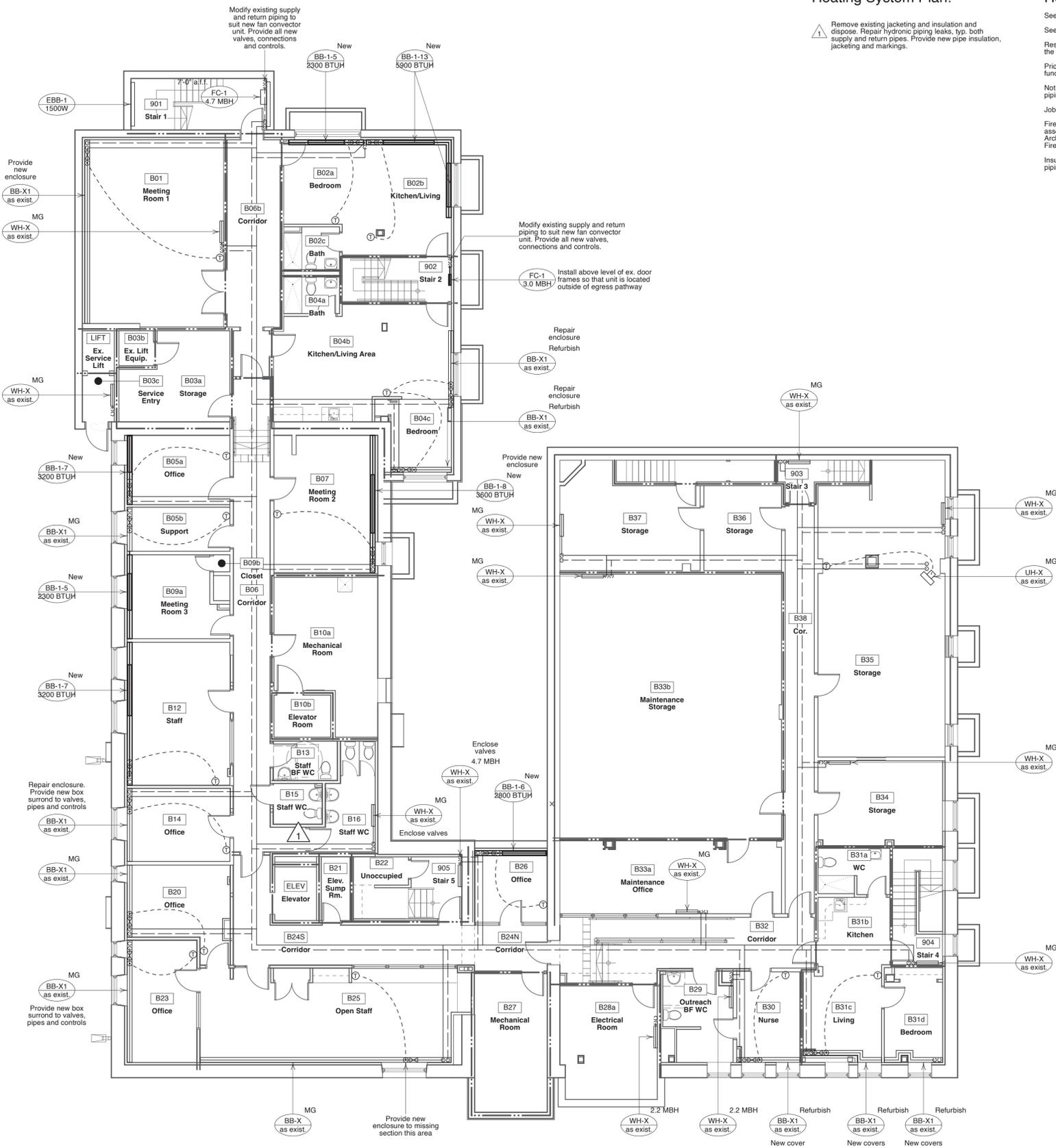
Approved	AD
Checked	MM
Drawing Title	Drawn MAM

**Basement Hydronic Heating System Plan**

Scale (for 24x36" printing) Dwg. No.  
1/8" = 1'-0" M201

M.A. Bryan Engineering Inc.

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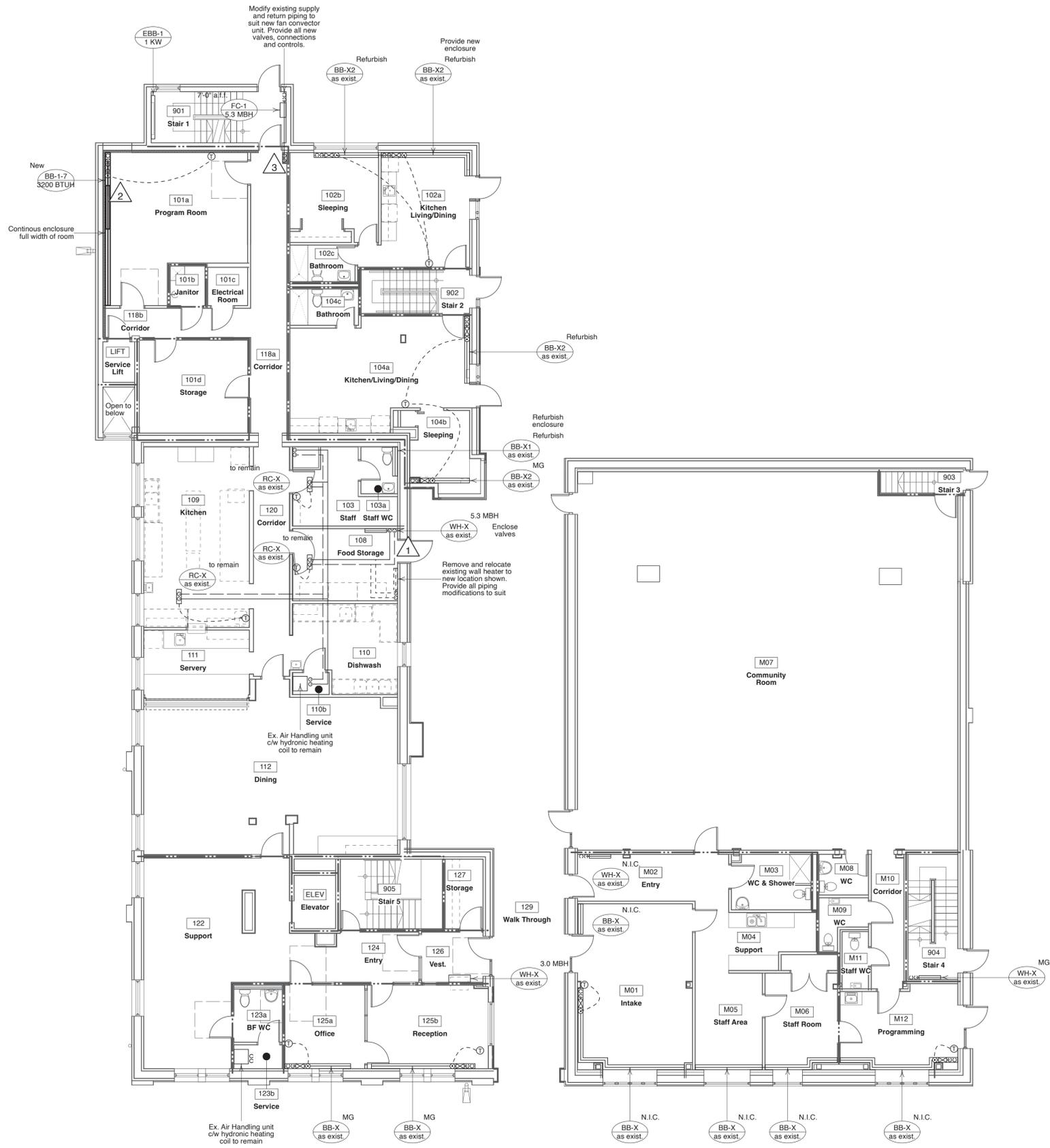
1 Basement Hydronic Heating System Plan  
M201 1/8" = 1'-0"

### Hydronic Heating Equipment Schedule:

Type	Unit	Description	Elec.	Remarks	L	W	H
HB-X	Existing Hydronic Heating System Boiler	Viessmann Vitodens 200-V Condensing boiler 8094.71234890YTN	120.1.60	Insert remarks here.	-	-	-
BB-X1	Existing Hydronic Base Board Heater	Slant Fin style baseboard hydronic heater, Approx. 460 BTUH/FT Element, 3/4" (19mm) ø pipe	-	Refurbish element fins. Make good enclosure. Provide new enclosure where noted. New enclosure to be complete with all wall brackets, wire (pipe) hangers, splice plates, and pieces, inside and outside corner pieces (to suit specific conditions), and all other accessories to ensure fully enclosed units	-	-	-
BB-X2	Existing Hydronic Base Board Heater	Baseboard hydronic heater c/w steel perforated enclosure approx. 460 BTUH/FT Element, 3/4" (19mm) ø pipe	-	Make good enclosures.	-	-	-
BB-1	Hydronic Base Board Heater	Insert Description of Existing here.	-	Provide c/w 50ø S&R piping, wall to wall installation (field modify to suit specific conditions), isolation valves, 24V VAV controller, 2-way valve, automatic circuit setter, 24V transformer, wall-mount hangers, continuous covers	-	-	-
UH-X	Existing Hydronic Unit Heater	Rosemex H-24 Hot Water Unit Heater Heating: 16MBH @ 200°F EWT Flow Rate: 1.6 GPM @ 0.72 Feet P.D. Blower: 680 CFM	-	-	-	-	-
UH-1	Hydronic Unit Heater	Rosemex H-24 Hot Water Unit Heater Heating: 16MBH @ 200°F EWT Flow Rate: 1.6 GPM @ 0.72 Feet P.D. Blower: 680 CFM	120.1.60	C/W isolation valves, unions, manual adjustable blower setter, Y-strainer, louver fin diffuser, integral t-Stat.	-	-	-
HH-1	Hydronic Fan Force Heater - Surface	Rosemex H-24 Hot Water Unit Heater Heating: 16MBH @ 200°F EWT Flow Rate: 1.6 GPM @ 0.72 Feet P.D. Blower: 680 CFM	120.1.60	C/W isolation valves, unions, manual adjustable blower setter, Y-strainer, louver fin diffuser, integral t-Stat.	-	-	-
HH-2	Hydronic Fan Force Heater - Surface	Rosemex H-24 Hot Water Unit Heater Heating: 16MBH @ 200°F EWT Flow Rate: 1.6 GPM @ 0.72 Feet P.D. Blower: 680 CFM	120.1.60	C/W isolation valves, unions, manual adjustable blower setter, Y-strainer, louver fin diffuser, integral t-Stat.	-	-	-
HH-3	Hydronic Fan Force Heater - Surface	Rosemex H-24 Hot Water Unit Heater Heating: 16MBH @ 200°F EWT Flow Rate: 1.6 GPM @ 0.72 Feet P.D. Blower: 680 CFM	120.1.60	C/W isolation valves, unions, manual adjustable blower setter, Y-strainer, louver fin diffuser, integral t-Stat.	-	-	-
WH-X	Ex. Wall Cabinet Hydronic Convactor Rad.	Existing unit to remain. Manufacturer unknown. Heating outputs rand from 1.5MBH to 5.7MGH	-	Unit operation runs wild, no thermostatic control.	-	-	-
WH-1	Hydronic Wall Heater	Rosemex H-24 Hot Water Unit Heater Heating: 16MBH @ 200°F EWT Flow Rate: 1.6 GPM @ 0.72 Feet P.D. Blower: 680 CFM	120.1.60	C/W isolation valves, unions, manual adjustable blower setter, Y-strainer, louver fin diffuser, integral t-Stat.	-	-	-
FC-1	New Hydronic Fan Convactor	New Fan Convactor: Caspian UV Model no.60 Low: 5801 BTUH at 130°F Average Water Temperature. 100W, 33dB, 0.24 USG. MERV 6 filter	120.1.60	C/W isolation valves, unions, manual adjustable blower setter, Y-strainer, louver fin diffuser, integral t-Stat.	24"	10"	24"
RC-X	Ex. Reheat Coil	Existing duct-mounted hydronic reheat coil to remain.	-	Refurbish as may be required.	-	-	-

### Electric Heater Schedule:

Type	Unit	Description	Remarks
EBB-X	Existing Electric Base Board Heater	Insert Description of Existing here.	Insert remarks here.
EBB-1	New Electric Base Board Heater	Wall mount base board heater Ouellet CFM1002 1.5 KW, 120.1.60	white, c/w built-in thermostat Approx. 48"L x 6"H x 3"D
EFH-1	New Electric Fan Heater	Surface Wall-mounted Fan Heater 1.5 KW, 120.1.60	white, c/w built-in thermostat Approx. 18"L x 24"H x 4"D



**Hydronic Systems Legend:**

Symbol	Description
BB-10 1.1	Heating Equipment Tag length of heating element - feet (10'-0") heating output - MBH (1100 BTUH)
—	supply piping
- - - - -	return piping
- - - - -	low voltage wiring to T-stats
⊖	thermostat (T-stat)
⊙	zone controller
⊗	Equipment Identification
FATB	from above to below
FA	from above
TB	to below
TBFA	to below from above
DTBS	down to below slab
MG	denotes existing unit to be made good. Repair minor dents and damage, clean and brush fins.
Refurbish	denotes existing unit to be removed, refurbish to as new condition, and reinstall. Provide all new missing covers.
New	denotes new unit. See also Schedules

**General Notes to Hydronic Heating System Plans:**

See also Division 01 requirements.  
 See also Sections 200500 and 200501.  
 Responsibility for Hydronic Heating Building System rests with the Mechanical Trade Contractor.  
 Prior to start of the work, test all systems components to verify function. Report findings to Owner and Consultant.  
 Not all hydronic heating system piping is shown. Confirm all piping, including liquid and suction lines.  
 Job check all existing conditions.  
 Fire-stop all penetrations through fire separations and all assemblies having a fire resistance rating. See also Architectural Documents for extent of separations and ratings. Firestop all penetrations whether existing or new.  
 Insulate all hydronic heating system piping. Where existing piping is found to be uninsulated, provide insulation.

**General Notes T-Stats:**

All existing thermostat controls for hydronic heating systems to be replaced with new c/w lockable, tamper-proof covers.

**Notes to Ground Floor Hydronic Heating System Plan:**

1. Connect to existing supply and return piping above LAF ceilings. Coordinate routing of piping with other services within ceilings, and new lighting layout. See also Electrical Documents.
2. CTE S&R piping fed to unit from below. Provide new balancing and control valves and all controls, interconnected with new thermostat. Ensure isolation valves are installed on both pipes.
3. Extend existing S&R piping up to high level to feed new fan convactor in stairs.

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T	For Tender	Dec. 19 '24	MM

**General Notes:**

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 For Owner Equipment Schedule see Sheet A921

For Mechanical Drawings see M series Sheets  
 For Electrical Drawings see E series Sheets



No.	Revision	Date	Initial

**Project**  
 RoW - 84 Frederick St.  
 Renovation & Renewal  
 84 Frederick St  
 Kitchener, ON

Approved	AD
Checked	MM
Drawing Title	Drawn MAM

**Ground Floor Hydronic Heating System Plan**

Scale (for 24x36" printing) 1/8" = 1'-0"  
 Dwg. No. M202

**M.A. Bryan Engineering Inc.**

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 mark@mabryan.com (519) 489-2674

1 Ground Floor Hydronic Heating System Plan  
 M202 1/8" = 1'-0"



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Hydronic Systems Legend:	
Symbol	Description
	Heating Equipment Tag length of heating element - feet (1'-0"=) heating output - MBH (1100 BTU/H)
	supply piping
	return piping
	low voltage wiring to T-stats
	thermostat (T-stat)
	zone controller
	Equipment Identification
FATB	from above to below
FA	from above
TB	to below
TBFA	to below from above
DTBS	down to below slab
MG	denotes existing unit to be made good. Repair minor dents and damage, clean and brush fins.
Refurbish	denotes existing unit to be removed, refurbish to as new condition, and reinstall. Provide all new missing covers.
New	denotes new unit. See also Schedules

### General Notes to Hydronic Heating System Plans:

- See also Division 01 requirements.
- See also Sections 200500 and 200501.
- Responsibility for Hydronic Heating Building System rests with the Mechanical Trade Contractor.
- Prior to start of the work, test all systems components to verify function. Report findings to Owner and Consultant.
- Not all hydronic heating system piping is shown. Confirm all piping, including liquid and suction lines.
- Job check all existing conditions.
- Fire-stop all penetrations through fire separations and all assemblies having a fire resistance rating. See also Architectural Documents for extent of separations and ratings. Firestop all penetrations whether existing or new.
- Insulate all hydronic heating system piping. Where existing piping is found to be uninsulated, provide insulation.

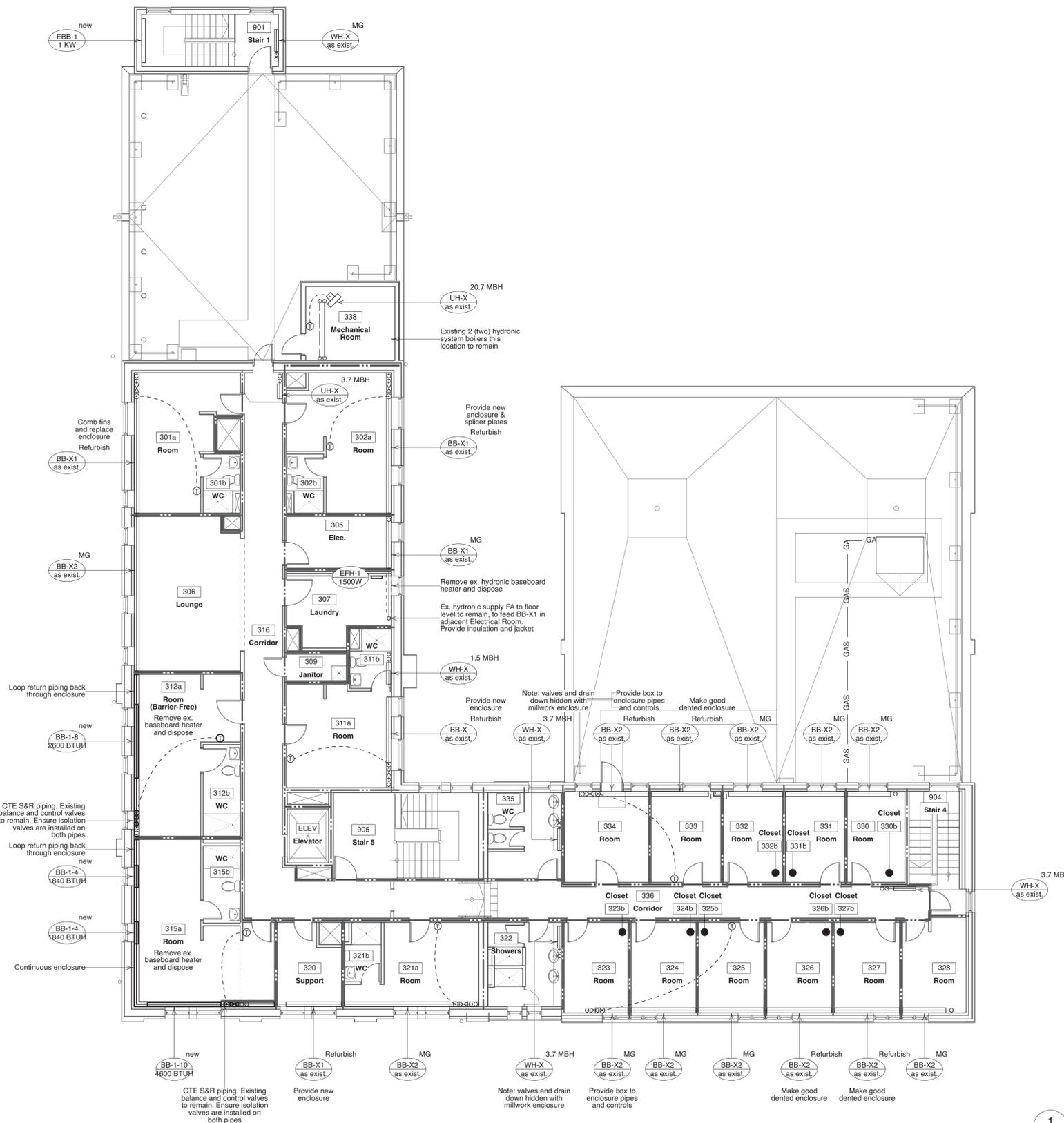
### General Notes T-Stats:

All existing thermostat controls for hydronic heating systems to be replaced with new c/w lockable, tamper-proof covers.

### General Notes:

- For Cover and General Notes see Sheet A001
- For OBC Matrix and Information see Sheet A011
- For WC Accessories OBC Requirements see Sheet A012
- For Assembly Types see Sheet A021
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- For Openings Schedules see A900 series Sheets
- For Room Finishes Schedules see A910 series Sheets
- For Owner Equipment Schedule see Sheet A921
- For Mechanical Drawings see M series Sheets
- For Electrical Drawings see E series Sheets

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3	90% Check Set	Dec. 12 '24	MM
T	For Tender	Dec. 19 '24	MM



1 Third Floor Hydronic Heating System plan  
M204 1/8" = 1'-0"

**Project**  
 RoW - 84 Frederick St.  
 Renovation & Renewal  
 84 Frederick St  
 Kitchener, ON

Approved	AD
Checked	MM
Drawn	MAM

**Drawing Title**  
 Third Floor Hydronic Heating System Plan

**Scale** (for 24x36" printing) **Dwg. No.**  
 1/8" = 1'-0" **M204**

**M.A. Bryan Engineering Inc.**

**Notes to Basement HVAC Plan:**

- 1. Provide modifications to existing duct routing to suit layout of new millwork by cash allowance. Remove and reinstall range hood to location directed by Consultant.
- 2. Existing exhaust outlet located within existing vertical chase below level of grade to remain. Chase extends up to grade with grate cover.

**General Notes to HVAC:**

All systems shall be installed in accordance with code requirement, and to ASHRAE and SMACNA standards. All material and equipment shall be new. Ductwork shall be of gauges as outlined by SMACNA standards. Equipment to be as outlined on the drawings and designed by the HVAC Trade Contractor.

**Abbreviations:**

- R denotes Return
- S denotes Supply
- FA denotes From Above
- TA denotes To Above
- FB denotes From Below
- TB denotes To Below

**General Notes to Existing Air Distribution Systems:**

Clean all existing ductwork distribution systems.

Replace all damaged return grilles with new, sized to suit existing ductwork and grilles. Job check. Provide new paint finish (to 099000) to Consultant instruction.

Replace all damaged supply diffusers with new.

**Mechanical Legend**

Symbol	Description
	supply duct
	return or exhaust duct
	Supply Diffuser Type
	R or E Grille Type
	acoustic insulation 13mm
	thermal insulation 25mm
	fire damper
	motorized damper
	manual balancing damper
	Return Grille
	Exhaust Grille
	transfer grille
	thermostat
	speed control
	Equipment Identification
	Owner's equipment (see Arch.)

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Project North

No.	Revision	Date	Initial

**Project**  
 RoW - 84 Frederick St.  
 Renovation & Renewal  
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 Kitchener, ON

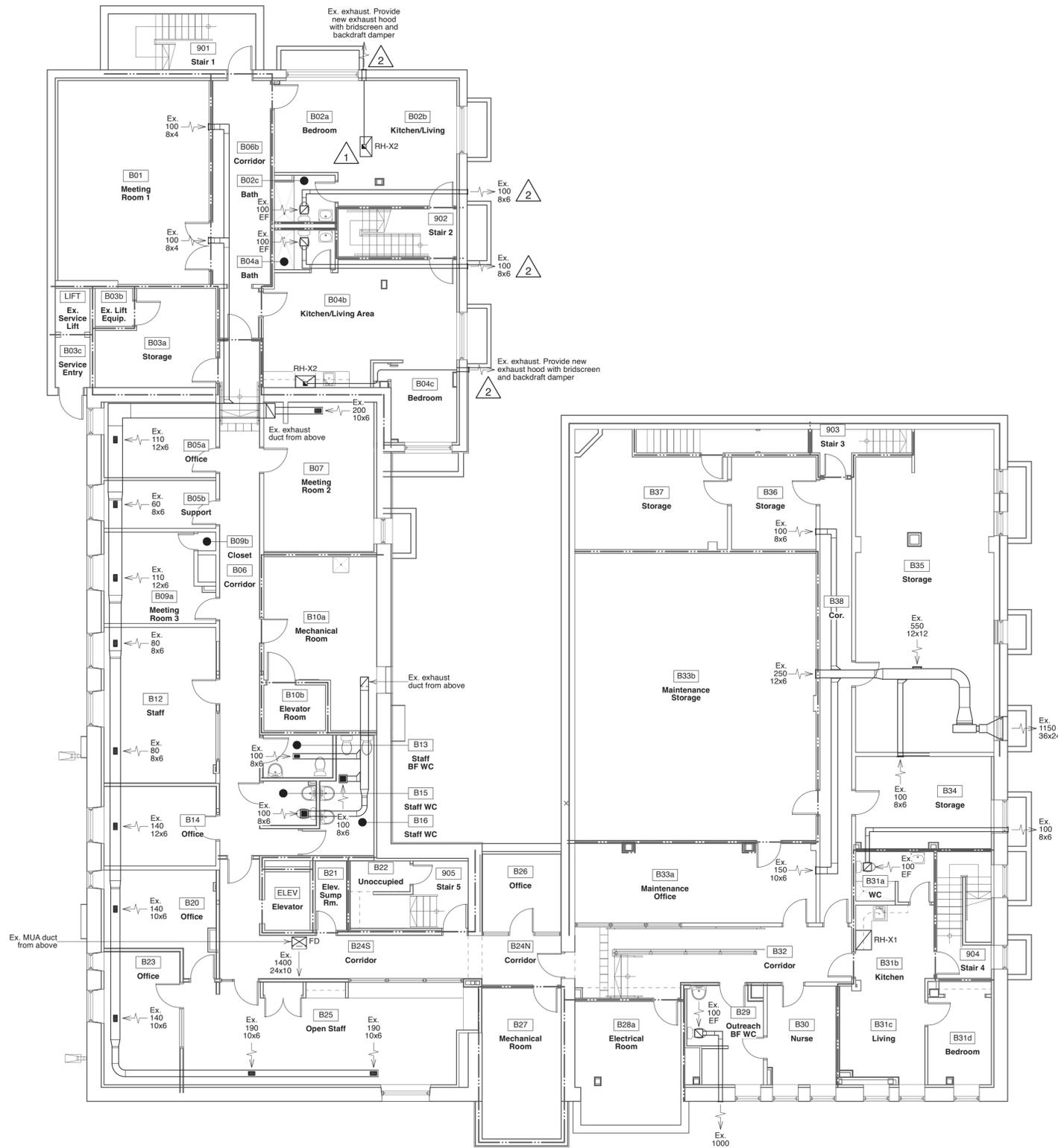
Drawing Title	Approved	AD

**Basement HVAC Plan**

Scale (for 24x36" printing) 1/8" = 1'-0"  
 Dwg. No. M301

M.A. Bryan Engineering Inc.

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**HVAC Equipment Schedule:**

Type	Unit	Description	Electrical	Remarks
ERV-1	Energy Recovery Ventilator	Lifebreath Metro 120 ERV Set at 100CFM	120 1.60 1.4 AMPS Receptacle	Provide c/w BDD filters, mounting brackets, digital controller. O/A intake/exhaust ducts to exterior terminations c/w thermal insulation. Unit operation to be controlled by Motion Sensor in the room.
DH-1	Duct Heater	Thermolec Thermo-Air TER-5-1-120 1KW heater	208 1.60 8.3 AMPS	Provide c/w automatic reset thermal cut-out, air flow sensor, manual reset thermal cut-out, temperature sensor, built-in temperature controller and sensor, mounting flanges. Set discharge @ 70°F. Mount heater on outlet of ERV. Ensure 3x duct diameter of clearance on either side of heater.
HP-1	Heat Pump Condensing Unit	LG LMU303HV Cooling: 3070 BTUH - 29515 BTUH, Rated 18000 BTUH Heating: 16760 BTUH at -4°F	208 1.60 13 MCA	Provide c/w base pan heater. Route refrigerant piping to 1 (one) DS-1. Install unit on wall bracket. Coordinate on site.
DS-1	Ductless Split Heat Pump Indoor Head	LG LSN180HSVS Wall Mounted Cooling: 18000 BTUH (H)	Feed from Heat Pump Condensing Unit HP-1	Provide c/w wall bracket, vibration isolation, wall mounted programmable T'stat with locking cover, refrigerant piping. Pipe condensate to adjacent Janitor Room mop sink. Coordinate on site.
CU-1	New Condensing Unit (Sleeping Room no. M07 Roof)	LG LMU303HV Cooling: 8400 BTUH - 36000 BTUH, rated 30000 BTUH	208 1.60 18.4 MCA	Route refrigerant piping to 2 (two) DS-2 and 1 (one) DS-3. Install to concrete pavers on SM insulation. Coordinate on site.
DS-2	Ductless Split Heat Pump Indoor Head (Room no. 234a & 234b)	LG LMN079HVT Wall Mounted Cooling: 7000 BTUH (nominal)	Feed from Condensing Unit CU-1	Provide c/w wall bracket, vibration isolation, wall mounted programmable T'stat with locking cover, refrigerant piping. Pipe condensate to nearest sanitary. Coordinate on site.
DS-3	Ductless Split Heat Pump Indoor Head (Room no. 236)	LG LSN181HSVS Wall Mounted Cooling: 18000 BTUH (Rated)	Feed from Condensing Unit CU-2	Provide c/w wall bracket, vibration isolation, wall mounted programmable T'stat with locking cover, refrigerant piping. Pipe condensate to nearest sanitary. Coordinate on site.
CU-2	New Condensing Unit	LG LMU303HV Cooling: 8400 BTUH - 36000 BTUH, rated 30000 BTUH	208 1.60 18.4MCA	Route refrigerant piping to 1 (one) DS-4 and 1 (one) DS-5. Install to concrete pavers on SM insulation. Coordinate on site.
DS-4	Ductless Split Heat Pump Indoor Head (Lounge no. 217)	LG LSN120HSVS Wall Mounted Cooling: 12000 BTUH (nominal)	Feed from Condensing Unit CU-2	Provide c/w wall bracket, vibration isolation, wall mounted programmable T'stat with locking cover, refrigerant piping. Pipe condensate to nearest sanitary. Coordinate on site.
DS-5	Ductless Split Heat Pump Indoor Head (Lounge no. 306)	LG LSN180HSVS Wall Mounted Cooling: 18000 BTUH (Rated)	Feed from Condensing Unit CU-2	Provide c/w wall bracket, vibration isolation, wall mounted programmable T'stat with locking cover, refrigerant piping. Pipe condensate to nearest sanitary. Coordinate on site.
RH-X1	Existing Range Hood	Existing recirculating range hood to remain	As Ex.	Clean, replace filters, and ensure function
RH-X2	Existing Range Hood	Existing range hood to remain c/w all exhaust ductwork and vent cap	As Ex.	Clean, replace filters, and ensure function
EF-X	Existing Bathroom Exhaust Fan	Existing exhaust fan to be reused in new location.		
EF-1	New Bathroom Exhaust Fan	Ortech Micro Compact Series Exhaust Fan ODM-8010	120V 60Hz	Provide c/w collar, back-draft damper, integral disconnect, and low profile "white" grille, duct connection and wall cap.

1 M301 Basement HVAC Plan  
 1/8" = 1'-0"

**General Notes to HVAC:**

All systems shall be installed in accordance with code requirement, and to ASHRAE and SMACNA standards. All material and equipment shall be new. Ductwork shall be as outlined on the drawings and designed by the HVAC Trade Contractor.

**Abbreviations:**

R denotes Return  
S denotes Supply  
FA denotes From Above  
TA denotes To Above  
FB denotes From Below  
TB denotes To Below

**Mechanical Legend**

Symbol	Description
	supply duct
	return or exhaust duct
	Supply Diffuser Type cfm grille
	R or E Grille Type cfm grille
	acoustic insulation 13mm
	thermal insulation 25mm
	fire damper
	motORIZED damper
	manual balancing damper
	Return Grille
	Exhaust Grille
	transfer grille
	thermostat
	speed control
	Equipment Identification
	Owner's equipment (see Arch.)

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1	90% Check Set	Dec. 12 '24	MM
T	For Tender	Dec. 19 '24	MM

**General Notes:**

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No.	Revision	Date	Initial

**Project**  
RoW - 84 Frederick St.  
Renovation & Renewal  
84 Frederick St  
Kitchener, ON

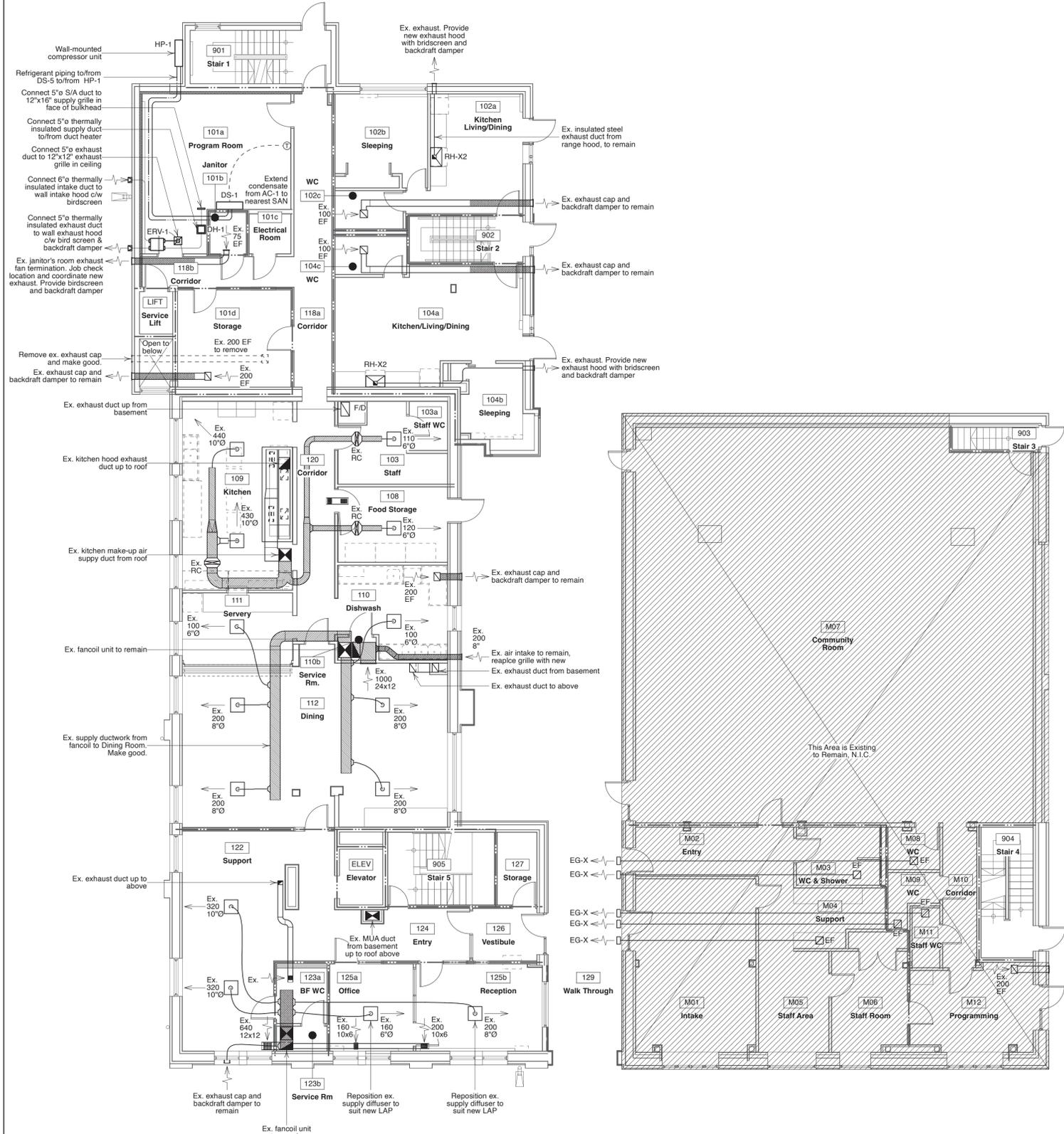
Approved	AD
Checked	MM
Drawing Title	Drawn MAM

**Ground Floor HVAC Plan**

Scale (for 24x36" printing) 1/8" = 1'-0"  
Dwg. No. M302

M.A. Bryan Engineering Inc.

285 Weber Street North, Unit B1, Waterloo, ON N2J 3H8  
mark@mabryan.com (519) 489-2674



1 Ground Floor HVAC Plan  
M302 1/8" = 1'-0"

**Notes to Second Floor HVAC Plan:**

1 Refrigerant piping routing shown diagrammatic. Route within existing partition u.n.o.

**General Notes to HVAC:**

All systems shall be installed in accordance with code requirement, and to ASHRAE and SMACNA standards. All material and equipment shall be new. Ductwork shall be of gauges as outlined by SMACNA standards. Equipment to be as outlined on the drawings and designed by the HVAC Trade Contractor.

**Abbreviations:**

R denotes Return  
S denotes Supply  
FA denotes From Above  
TA denotes To Above  
FB denotes From Below  
TB denotes to Below

**Mechanical Legend**

Symbol	Description
	supply duct
	return or exhaust duct
A 100 ø 200	Supply Diffuser Type cfm grille
EG1 75 150 x 200	R or E Grille Type cfm grille
	acoustic insulation 13mm
	thermal insulation 25mm
F.D.	fire damper
M.D.	motorized damper
B.D.	manual balancing damper
RG	Return Grille
EG	Exhaust Grille
TG	transfer grille
T	thermostat
S	speed control
EF-1	Equipment Identification
(1.1)	Owner's equipment (see Arch.)

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No.	Revision	Date	Initial

**Project**  
RoW - 84 Frederick St.  
Renovation & Renewal  
84 Frederick St  
Kitchener, ON

Approved	AD
Checked	MM
Drawing Title	Drawn MAM

**Second Floor HVAC Plan**

Scale (for 24x36" printing) 1/8" = 1'-0" Dwg. No. M303

M.A. Bryan Engineering Inc.

285 Weber Street North, Unit B1, Waterloo, ON N2J 3H8  
mark@mabryan.com (519) 489-2674



1 Second Floor HVAC Plan  
M303 1/8" = 1'-0"

**General Notes to HVAC:**

All systems shall be installed in accordance with code requirement, and to ASHRAE and SMACNA standards. All material and equipment shall be new. Ductwork shall be of gauges as outlined by SMACNA standards. Equipment to be as outlined on the drawings and designed by the HVAC Trade Contractor.

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**Mechanical Legend**

Symbol	Description
	supply duct
	return or exhaust duct
A 100 o 200	Supply Diffuser Type cfm grille
EG1 75 150 x 200	R or E Grille Type cfm grille
	acoustic insulation 13mm
	thermal insulation 25mm
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M.D.	motorized damper
B.D.	manual balancing damper
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EF-1	Equipment Identification
(1.1)	Owner's equipment (see Arch.)

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No.	Revision	Date	Initial

**Project**  
RoW - 84 Frederick St.  
Renovation & Renewal  
84 Frederick St  
Kitchener, ON

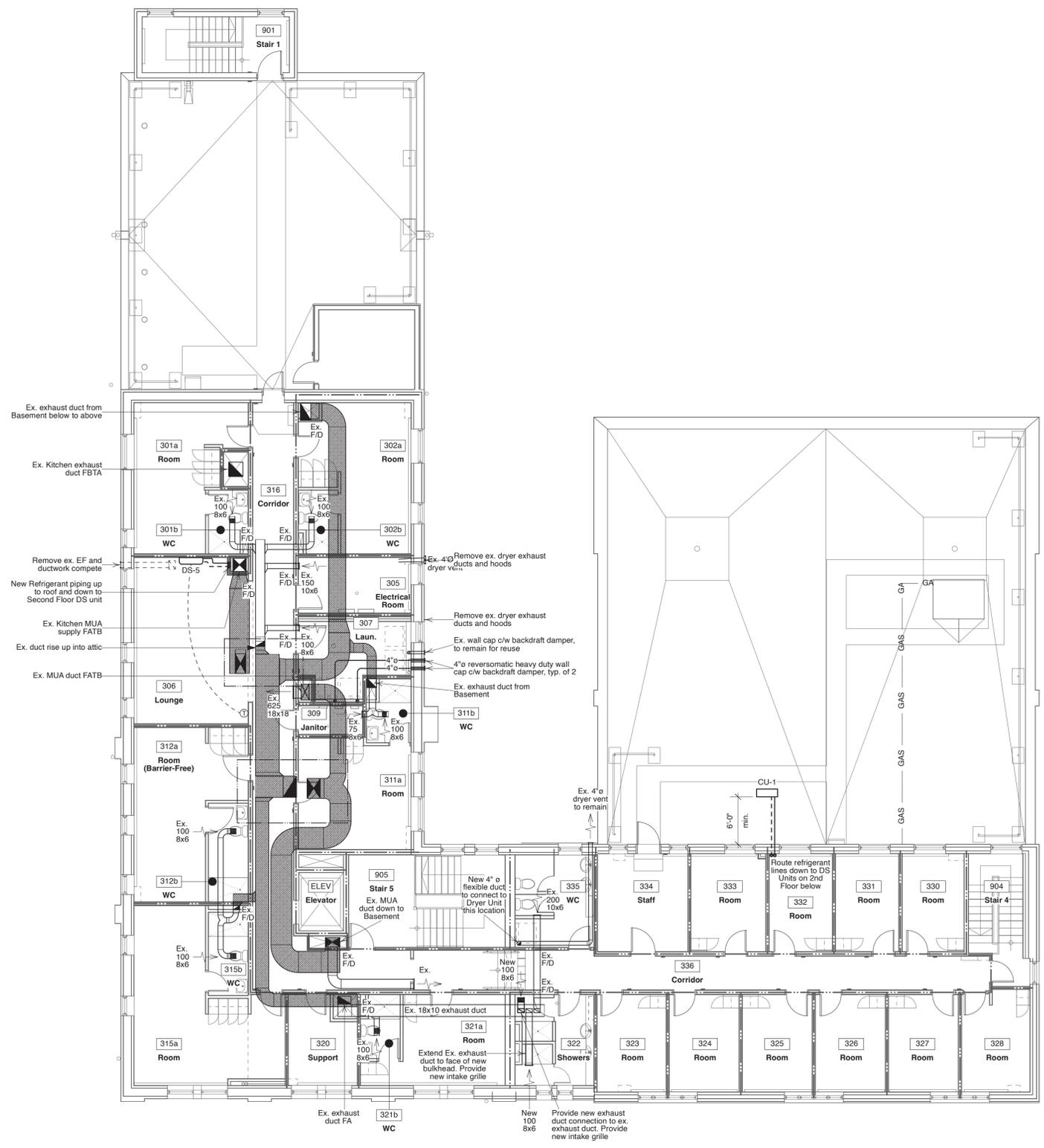
Approved	AD
Checked	MM
Drawing Title	Drawn MAM

**Third Floor HVAC Plan**

Scale (for 24x36" printing) 1/8" = 1'-0"  
Dwg. No. M304

M.A. Bryan Engineering Inc.

285 Weber Street North, Unit B1, Waterloo, ON N2J 3H8  
mark@mabryan.com (519) 489-2674



1 Third Floor HVAC Plan  
M304 1/8" = 1'-0"

**General Notes to HVAC:**

All systems shall be installed in accordance with code requirement, and to ASHRAE and SMACNA standards. All material and equipment shall be new. Ductwork shall be of gauges as outlined by SMACNA standards. Equipment to be as outlined on the drawings and designed by the HVAC Trade Contractor.

**Abbreviations:**

R denotes Return  
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FB denotes From Below  
TB denotes To Below

**Mechanical Legend**

Symbol	Description
	supply duct
	return or exhaust duct
A 100 o 200	Supply Diffuser Type cfm grille
EG1 75 150 x 200	R or E Grille Type cfm grille
	acoustic insulation 13mm
	thermal insulation 25mm
F.D.	fire damper
M.D.	motorized damper
B.D.	manual balancing damper
RG	Return Grille
EG	Exhaust Grille
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T	thermostat
S	speed control
EF-1	Equipment Identification
(1.1)	Owner's equipment (see Arch.)

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For Mechanical Drawings see M series Sheets  
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No.	Revision	Date	Initial

**Project**  
RoW - 84 Frederick St.  
Renovation & Renewal  
84 Frederick St  
Kitchener, ON

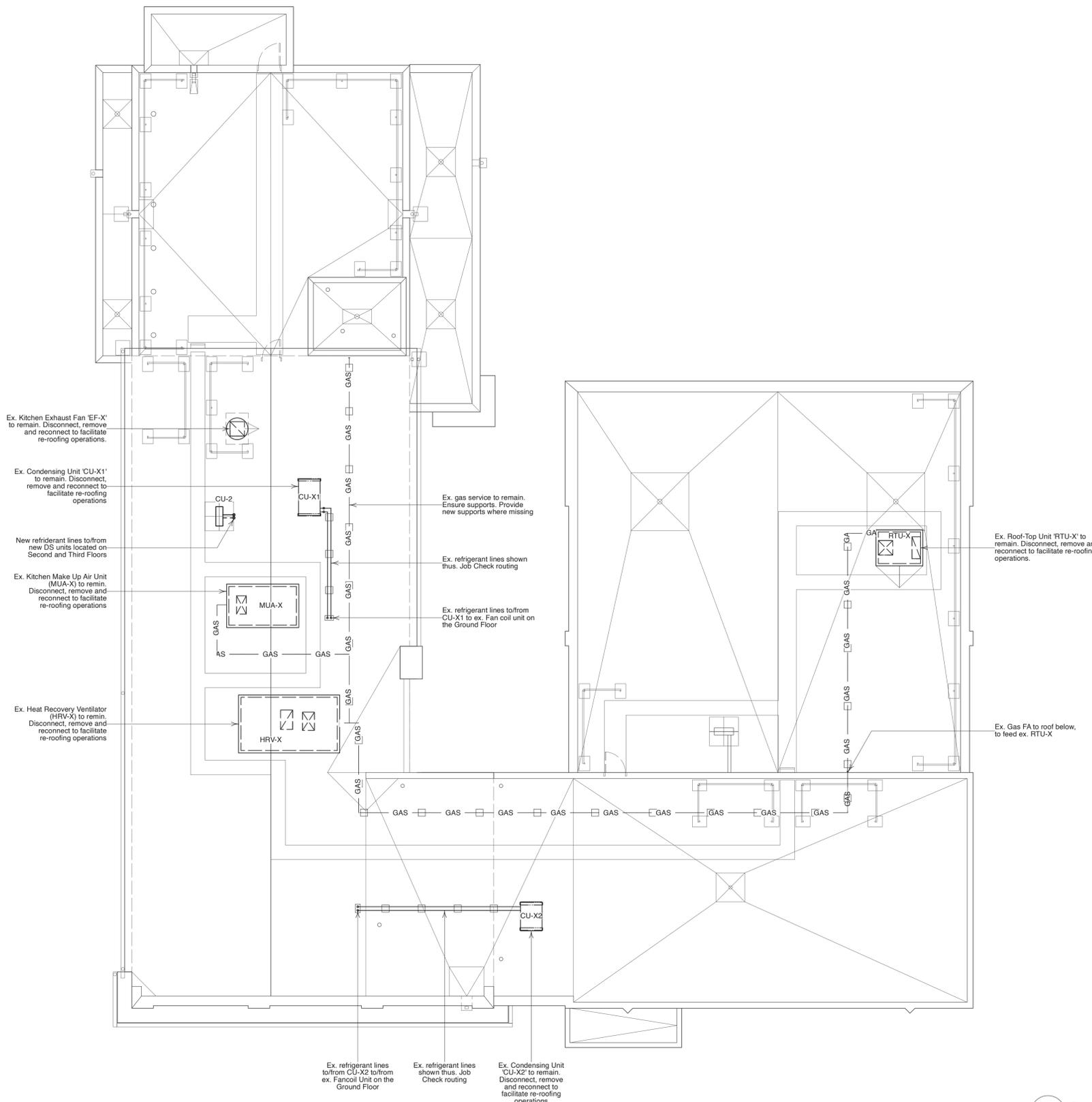
Approved	AD
Checked	MM
Drawn	MAM

**Roof**  
HVAC Plan

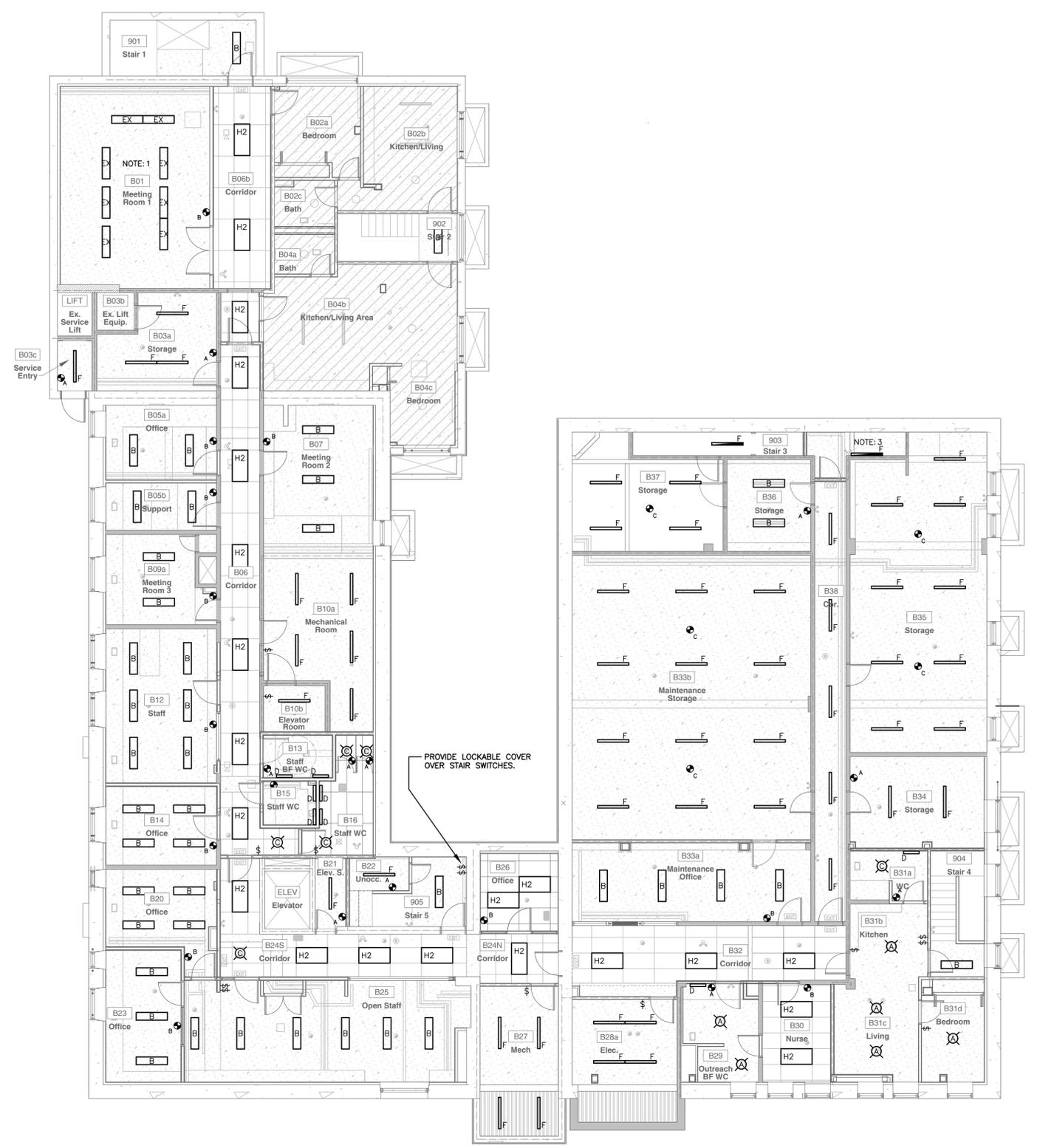
Scale (for 24x36" printing) 1/8" = 1'-0"  
Dwg. No. M305

**M.A. Bryan Engineering Inc.**

285 Weber Street North, Unit B1, Waterloo, ON N2J 3H8  
mark@mabryan.com (519) 489-2674

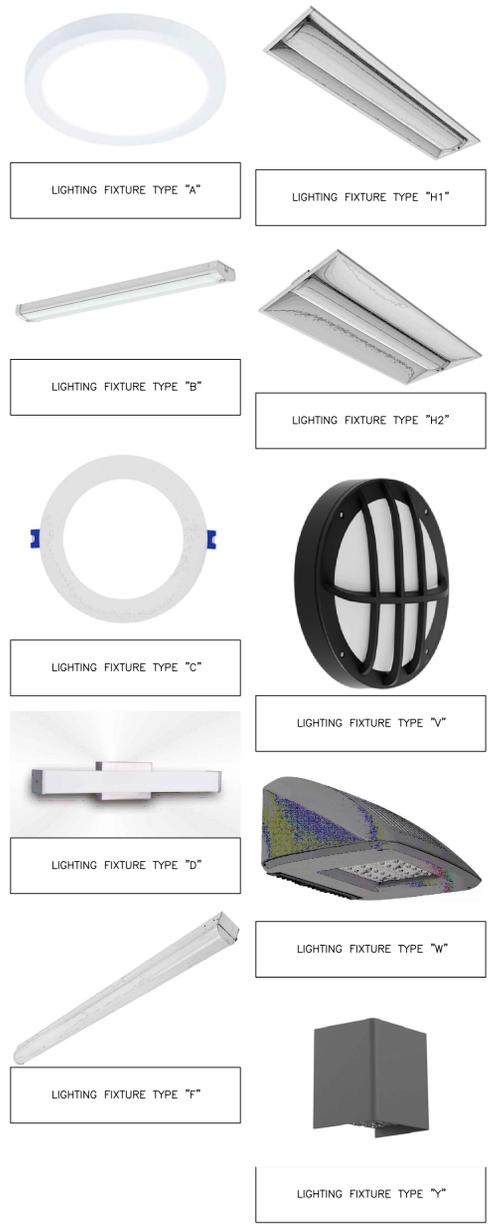


1 Roof HVAC Plan  
M305 1/8" = 1'-0"



**LIGHTING NOTES:**

1. REMOVE AND REINSTALL EXISTING LIGHTS TO SUIT CEILING REPLACEMENT.
2. ALL EXISTING TOGGLE SWITCHES TO BE REPLACED WITH NEW (WHERE THEY ARE NOT BEING REPLACED WITH MOTION SENSOR SWITCHES).
3. INDICATED LIGHTING FIXTURE TO BE WALL MOUNTED.



ELECTRICAL LEGEND	
	LIGHT FIXTURE ( z = TYPE AS PER SCHEDULE )
	WALL MOUNTED LIGHT FIXTURE ( z = TYPE AS PER SCHEDULE )
	CEILING MOUNTED EXIT LIGHT ( SHADED PORTION INDICATES FACE )
	WALL MOUNTED EXIT LIGHT ( SHADED PORTION INDICATES FACE )
	COMBINATION EXIT LIGHT/EMERGENCY LIGHT
	EMERGENCY BATTERY UNIT
	REMOTE EMERGENCY LIGHTING HEADS ( SINGLE OR DOUBLE AS SHOWN )
	UNIVERSAL WASHROOM AUDIO/VISUAL EMERGENCY SIGNAL DEVICE
	DUPLEX RECEPTACLE
	DUPLEX RECEPTACLE ( 102mm ABOVE COUNTER BACKSPASH, OR AS SHOWN )
	20A T-SLOT RECEPTACLE
	20A T-SLOT RECEPTACLE ( 102mm ABOVE COUNTER BACKSPASH )
	SPECIAL RECEPTACLE ( AS NOTED )
	DIRECT WIRED CONNECTION
	SYSTEM FURNITURE BASE POWER FEED
	GF1 GROUND FAULT PROTECTION
	WP WEATHERPROOF ( WHILE IN-USE COVER )
	CL CEILING MOUNTED
	EX EXISTING TO REMAIN
	REL RELOCATED EXISTING DEVICE
	RM EXISTING DEVICE TO BE REMOVED
	RP EXISTING DEVICE TO BE REMOVED AND REPLACED
	\$ TOGGLE SWITCH ( 3,4 = 3 OR 4 WAY, K = KEY OPERATED )
	z <sup>2</sup> LIGHTING CONTROL SENSOR ( z = TYPE AS PER SCHEDULE )
	COMBINATION VOICE/DATA OUTLET
	CABLE TELEVISION OUTLET
	PUSHBUTTON
	DOOR CONTACT
	ELECTROMAGNETIC LOCK
	ELECTRIC STRIKE
	CARD READER
	POWER PACK
	Wi-Fi AP
	NETWORK VIDEO RECORDER EQUIPMENT
	SURVEILLANCE CAMERA
	DISCONNECT SWITCH
	POWER PANEL
	SMOKE ALARM C/W AUDIO/VISUAL ( 120V & 7-DAY BATTERY )
	SMOKE DETECTOR ( SYSTEM CONNECTED )
	MANUAL PULL STATION
	F92 197° THERMAL FIXED DETECTOR ( 92° C )
	R 135° THERMAL FIXED R OF R DETECTOR ( 57° C )
	FIRE ALARM HORN
	zz FIRE ALARM HORN/STROBE COMBINATION UNIT ( zz = CANDELA POWER )
	zz FIRE ALARM STROBE ( zz = CANDELA POWER )
	FIRE ALARM ANNUNCIATOR OR CONTROL PANEL AS SHOWN



No	REVISION	DATE
4		
3		
T	ISSUED FOR PERMIT & TENDER	2024.12.19
2	ISSUED FOR 90% REVIEW	2024.12.12
1	ISSUED FOR 30% REVIEW	2024.12.05

**MIGHTON ENGINEERING**

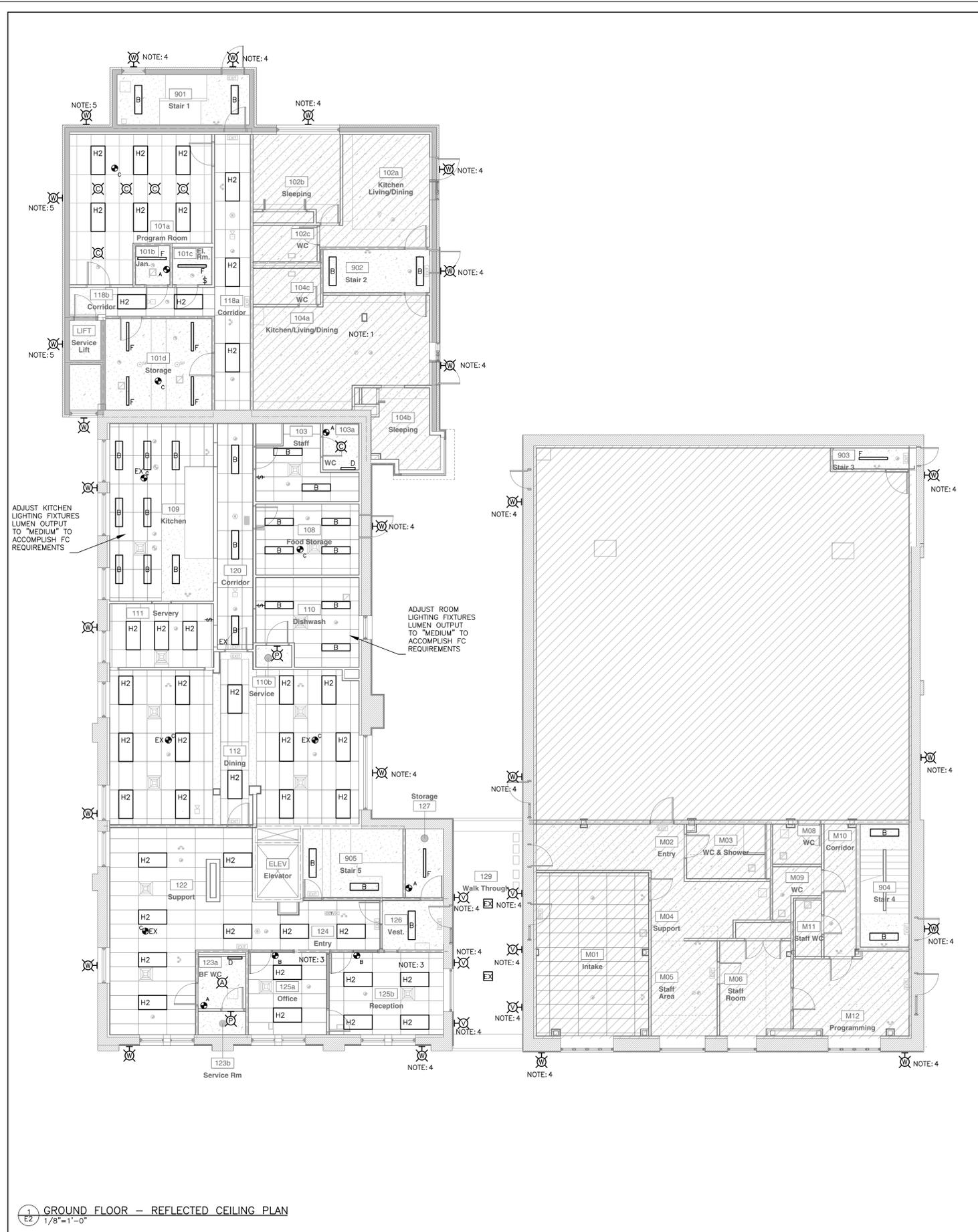
493 LANCASTER ST. W. UNIT 204 PH (519) 745-3703  
KITCHENER, ON N2K 1L8 WEB www.mighton.com

PROJECT TITLE:  
**ROW - 84 FREDERICK ST. RENOVATION & RENEWAL**

84 FREDERICK ST.  
KITCHENER, ON

DRAWING TITLE:  
**LIGHTING BASEMENT - RCP**

DRAWN BY: D.Z.	CUSTOMER PROJECT No. -
CHECKED BY: M.J.	MIGHTON PROJECT No. 45061
DATE: DECEMBER 2024	DRAWING No. E1
SCALE: AS NOTED	



- LIGHTING NOTES:**
1. REMOVE AND REINSTALL EXISTING LIGHTS TO SUIT CEILING REPLACEMENT.
  2. ALL EXISTING TOGGLE SWITCHES TO BE REPLACED WITH NEW (WHERE THEY ARE NOT BEING REPLACED WITH MOTION SENSOR SWITCHES).
  3. REMOVE EXISTING WALL SCONCES IN NOTED ROOMS. TOTAL OF TWO PER ROOM. REMOVE ASSOCIATED SWITCH.
  4. NOTED EXTERIOR LIGHTING REPLACES AN EXISTING FIXTURE.
  5. NOTES EXTERIOR FIXTURE IS NEW AND REQUIRES POWER FROM EXISTING EXTERIOR LIGHTING CIRCUIT.

1 GROUND FLOOR – REFLECTED CEILING PLAN  
 1/8"=1'-0"



4		
3		
T	ISSUED FOR PERMIT & TENDER	2024.12.19
2	ISSUED FOR 90% REVIEW	2024.12.12
1	ISSUED FOR 30% REVIEW	2024.12.05
No	REVISION	DATE

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PROJECT TITLE:  
 ROW – 84 FREDERICK ST.  
 RENOVATION & RENEWAL  
 84 FREDERICK ST.  
 KITCHENER, ON

DRAWING TITLE:  
 LIGHTING  
 GROUND FLOOR – RCP

DRAWN BY:	D.Z.	CUSTOMER PROJECT No.	-
CHECKED BY:	M.J.J.	MIGHTON PROJECT No.	45061
DATE:	DECEMBER 2024	DRAWING No.	E2
SCALE:	AS NOTED		



**LIGHTING NOTES:**  
 1. ALL EXISTING TOGGLE SWITCHES TO BE REPLACED WITH NEW (WHERE THEY ARE NOT BEING REPLACED WITH MOTION SENSOR SWITCHES).

**1 SECOND FLOOR - REFLECTED CEILING PLAN**  
 1/8"=1'-0"



4		
3		
T	ISSUED FOR PERMIT & TENDER	2024.12.19
2	ISSUED FOR 90% REVIEW	2024.12.12
1	ISSUED FOR 30% REVIEW	2024.12.05
No	REVISION	DATE

**MIGHTON ENGINEERING**  
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 KITCHENER, ON N2K 1L8 WEB www.mighton.com

PROJECT TITLE:  
**ROW - 84 FREDERICK ST. RENOVATION & RENEWAL**  
 84 FREDERICK ST.  
 KITCHENER, ON

DRAWING TITLE:  
**LIGHTING SECOND FLOOR - RCP**

DRAWN BY:	D.Z.	CUSTOMER PROJECT No.	-
CHECKED BY:	M.J.	MIGHTON PROJECT No.	45061
DATE:	DECEMBER 2024	DRAWING No.	E3
SCALE:	AS NOTED		

**LIGHTING NOTES:**  
 1. ALL EXISTING TOGGLE SWITCHES TO BE REPLACED WITH NEW (WHERE THEY ARE NOT BEING REPLACED WITH MOTION SENSOR SWITCHES).



1 THIRD FLOOR – REFLECTED CEILING PLAN  
 1/8"=1'-0"

LUMINAIRE SCHEDULE						
TYPE	ACCEPTABLE MANUFACTURERS	MODELS	CATALOGUE NUMBERS	DESCRIPTION WATTS/LUMENS VOLTAGE	LOCATION MOUNTING HEIGHT	NOTES
A	SIGNIFY LIGHTOLIER	SD	SD.14R.SLM.Z10.SCT.U.W	14" ROUND. DOWN. 25W 120V	SUITES SURFACE CEILING	C/W COLOUR TEMPERATURE SELECTION SWITCH C/W LIGHT OUT SELECTOR SWITCH
B	SIGNIFY DAY BRITE	NWL	NWL.4.3050L.8CST.UNV.DIM	4' LED WRAP XXW 120V	HALLWAY RECESSED CEILING	C/W COLOUR TEMPERATURE SELECTION SWITCH C/W LIGHT OUT SELECTOR SWITCH
C	SIGNIFY LIGHTOLIER	FD	FD.6S.SLM.Z10.SCT.U	6" SQUARE DOWN. 15W 120V	WASHROOMS RECESSED CEILING	C/W COLOUR TEMPERATURE SELECTION SWITCH C/W LIGHT OUT SELECTOR SWITCH
D	NEXLEDS	NX	NX.VLDR.2F.25W	2' VANITY LIGHT 25W 120V	WASHROOM SURFACE WALL	C/W COLOUR TEMPERATURE SELECTION SWITCH
F	SIGNIFY DAY BRITE	SDS	SDS.4.2448L.8CST.UN3.DIM	4' STRIP LIGHT 30W 120V	UTILITIES SURFACE CEILING	C/W COLOUR TEMPERATURE SELECTION SWITCH C/W LIGHT OUT SELECTOR SWITCH C/W CHAIN HANGER
H1	SIGNIFY DAY BRITE	DSRT	1.DSRT.3050L.CS.4.UNV.DIM	1X4' TROFFER 51W 120V	GENERAL RECESSED CEILING	C/W COLOUR TEMPERATURE SELECTION SWITCH C/W LIGHT OUT SELECTOR SWITCH
H2	SIGNIFY DAY BRITE	DSRT	2.DSRT.4060L.CS.4.UNV.DIM	2X4' TROFFER 39W 120V	GENERAL RECESSED CEILING	C/W COLOUR TEMPERATURE SELECTION SWITCH C/W LIGHT OUT SELECTOR SWITCH
P	-	-	-	KEYLESS LAMP H. 2W 120V	GENERAL SURFACE WALL	
V	ORACLE LIGHTING	OWM	OWM.R.201.LED.4000L.DIM10 MVOLT.30K/40K/50K.BK	EXT. WALL SCENCE 40W 120V	GENERAL SURFACE WALL	C/W COLOUR TEMPERATURE SELECTION SWITCH
W	GARDCO	121	121.16L.200.NW-G4.2.120.BK	EXT. WALL SCENCE 12W 120V	GENERAL SURFACE WALL	
Y	GARDCO	GBS	GBS.A01.740.T2M.120.FAWS.BK	EXT. WALL SCENCE 10W 120V	GENERAL SURFACE WALL	

LIGHTING CONTROL SENSOR SCHEDULE							
TYPE	MANUFACTURER	CATALOGUE NUMBER	VOLTAGE	SENSOR TECHNOLOGY	MOUNTING	DESCRIPTION	CONTROL SETTINGS
A	WATT STOPPER	PW-301	120V	PIR	WALL @ SWITCH HEIGHT	AUTOMATIC WALL SWITCH	AUTO TIME DELAY 7-20 MINUTES
B	WATT STOPPER	PW-101D-W	120V	PIR	WALL @ SWITCH HEIGHT	AUTOMATIC DIMMABLE WALL SWITCH	AUTO TIME DELAY 7-20 MINUTES
C	WATT STOPPER	DT-300	24V	PIR/ULTRASONIC	WALL @ SWITCH HEIGHT	AUTOMATIC WALL SWITCH	AUTO TIME DELAY 7-20 MINUTES
BP	WATT STOPPER	BZ-50	120V/24V	20A POWER PACK		POWER PACK FOR CEILING SENSOR	

• ALL HALLWAY AND WASHROOM OCCUPANCY SENSORS ARE TO BE SET TO A MINIMUM OF 15 MINUTES.  
 • IT IS THE CONTRACTORS RESPONSIBILITY TO COORDINATE NUMBER OF SENSORS, POWER PACKS AND WIRING DETAILS WITH MANUFACTURER IF AN ALTERNATIVE SENSOR IS USED TO THE ONE SPECIFIED. ALTERNATIVE SENSORS MAY NOT BE COMPATIBLE WITH LOADS DETAILED ON THE PLANS.  
 • ACCEPTABLE MANUFACTURERS: HUBBELL, WATT STOPPER, SENSOR SWITCH, LEVITON, COOPER GREENGATE, STEINEL.



No	REVISION	DATE
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3		
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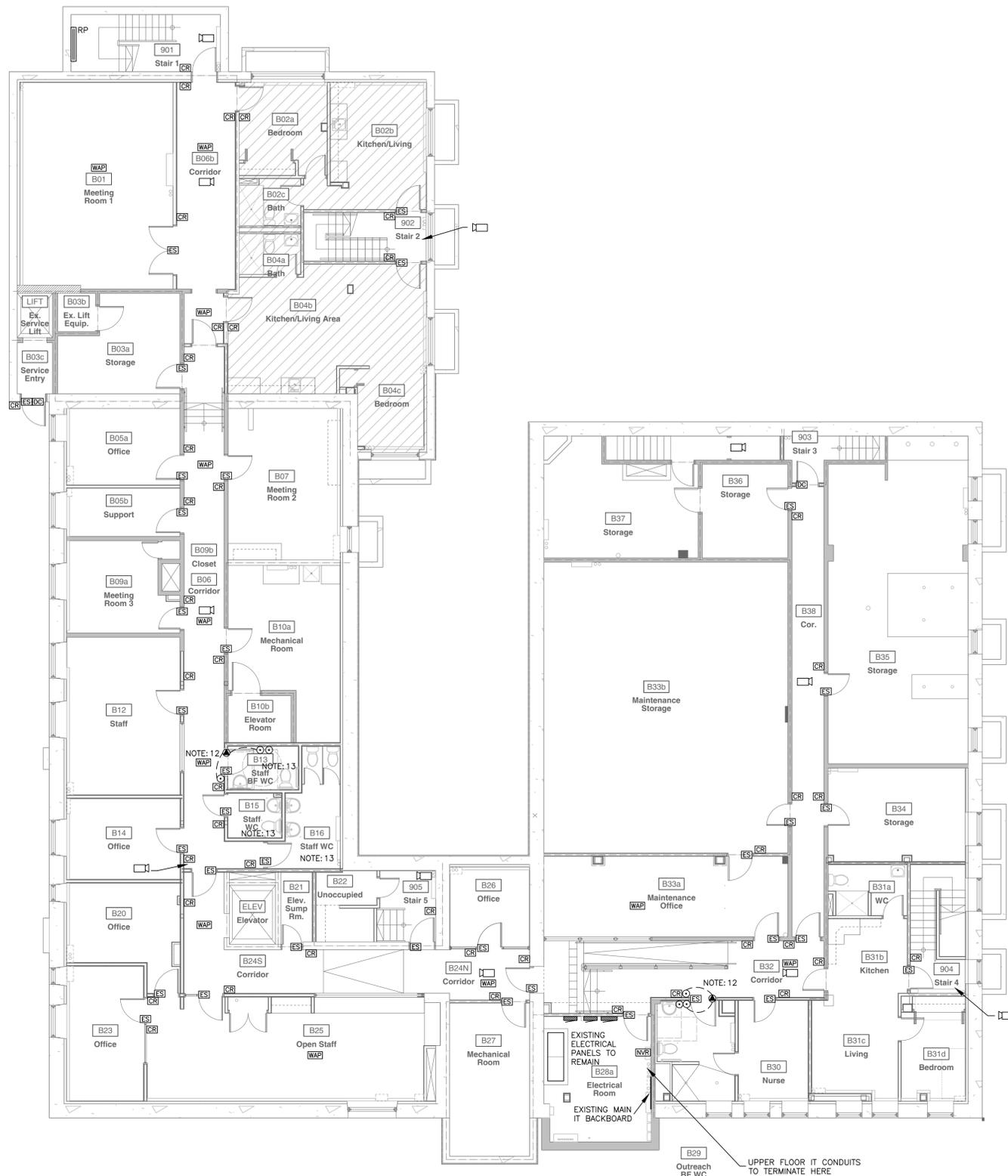


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 KITCHENER, ON N2K 1L8 WEB www.mighton.com

PROJECT TITLE:  
 ROW – 84 FREDERICK ST. RENOVATION & RENEWAL  
 84 FREDERICK ST. KITCHENER, ON

DRAWING TITLE:  
 LIGHTING THIRD FLOOR – RCP

DRAWN BY: D.Z.	CUSTOMER PROJECT No. -
CHECKED BY: M.J.	MIGHTON PROJECT No. 45061
DATE: DECEMBER 2024	DRAWING No. E4
SCALE: AS NOTED	



- POWER NOTES:**
1. ALL EXISTING POWER RECEPTACLES TO REMAIN IN THE INDICATED AREA.
  2. REMOVE EXISTING WASHING MACHINES AND DRYERS RECEPTACLES.
  3. DISCONNECT AND REMOVE EXISTING EXHAUST FAN & SWITCH IN INDICATED ROOM, INSTALL COVER PLATE.
  4. REPLACE ALL EXISTING RECEPTACLES WITH AFCI DUPLEX RECEPTACLES IN INDICATED ROOM.
  5. REMOVE ANY RECEPTACLES AND LIGHT SWITCHES THAT ARE IN THE EXISTING CORRIDOR WALL SECTION OF THIS ROOM TO ENLARGE THE WALL OPENING. COORDINATE THE INSTALLATION OF NEW RECEPTACLES AND LIGHT SWITCHES WITH OWNER PRIOR ELECTRICAL ROUGH-INS.
  6. ALL EXISTING RECEPTACLES IN SHELTER AND SLEEPING ROOMS TO BE REPLACED WITH AFCI TYPE.
  7. EXISTING HEATING BOILER SYSTEMS TO REMAIN.
  8. DISCONNECT EXISTING ELECTRICAL COMPONENTS (UNDER CABINET LIGHTING, STOVE, FAN & FRIDGE), AND REMOVE CONNECTIONS/RECEPTACLES TO FIT THE SPACE AS SHOWN.
  9. RELOCATE EXISTING TWO COUNTER DUPLEX RECEPTACLES CONNECTIONS TO REGULAR RECEPTACLE HEIGHT. REPLACE EXISTING RECEPTACLES WITH AFCI TYPE.
  10. EXISTING POWER FOR WASHER & DRYER TO REMAIN.
  11. ALL EXISTING RECEPTACLES IN SLEEPING ROOMS OR DWELLING UNITS TO BE REPLACED WITH AFCI TYPE TAMPER RESISTANT RECEPTACLES. BUDGET 1.5 PER SLEEPING ROOM AND 12 PER DWELLING UNIT.
  12. CONTRACTOR IS TO PROVIDE 16MM CONDUIT BETWEEN PUSHBUTTONS AND DOOR OPERATOR AND PROVIDE NOTED POWER CONNECTION TO OPERATOR. COORDINATE WITH SHOP DRAWINGS AND DOOR HARDWARE SUPPLIER PRIOR TO ROUGH-IN.
  13. EXISTING HAND DRYER IN NOTED ROOM TO BE REPLACED WITH NEW HAND DRYER C/W SENSOR BASED CONTROLS, WORLD DRYER OR EQUAL. CONFIRM EXISTING DRYER VOLTAGE PRIOR TO ORDERING NEW DRYER. TOTAL OF THREE ROOMS.

**1** BASEMENT – FLOOR PLAN  
1/8"=1'-0"



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T	ISSUED FOR PERMIT & TENDER	2024.12.19
2	ISSUED FOR 90% REVIEW	2024.12.12
1	ISSUED FOR 30% REVIEW	2024.12.05
No	REVISION	DATE

**MIGHTON ENGINEERING**

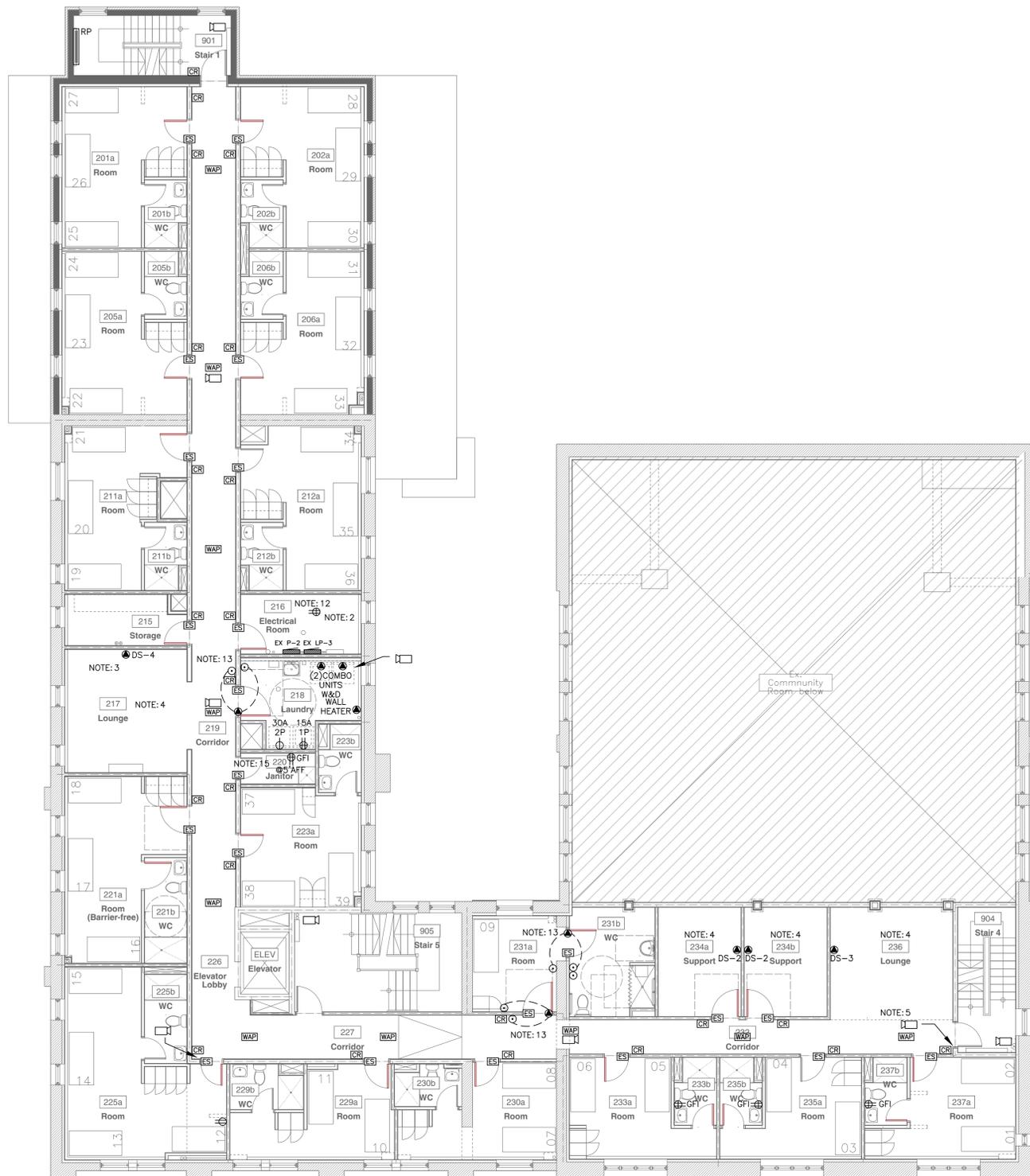
493 LANCASTER ST. W. UNIT 204 PH (519) 745-3703  
KITCHENER, ON N2K 1L8 WEB www.mighton.com

PROJECT TITLE:  
**ROW – 84 FREDERICK ST. RENOVATION & RENEWAL**  
84 FREDERICK ST.  
KITCHENER, ON

DRAWING TITLE:  
**POWER & COMMUNICATIONS BASEMENT – FLOOR PLAN**

DRAWN BY:	D.Z.	CUSTOMER PROJECT No.	-
CHECKED BY:	M.J.	MIGHTON PROJECT No.	45061
DATE:	DECEMBER 2024	DRAWING No.	E5
SCALE:	AS NOTED		





**POWER NOTES:**

1. ALL EXISTING POWER RECEPTACLES TO REMAIN IN THE INDICATED AREA.
2. REMOVE EXISTING WASHING MACHINES AND DRYERS RECEPTACLES. REUSE POWER FEED TO NEW LOCATIONS IN LAUNDRY ROOM.
3. DISCONNECT AND REMOVE EXISTING EXHAUST FAN & SWITCH IN INDICATED ROOM. INSTALL COVER PLATE.
4. REPLACE ALL EXISTING RECEPTACLES WITH AFCI DUPLEX RECEPTACLES IN INDICATED ROOM.
5. REMOVE ANY RECEPTACLES AND LIGHT SWITCHES THAT ARE IN THE EXISTING CORRIDOR WALL SECTION OF THIS ROOM TO ENLARGE THE WALL OPENING. COORDINATE THE INSTALLATION OF NEW RECEPTACLES AND LIGHT SWITCHES WITH OWNER PRIOR ELECTRICAL ROUGH-INS.
6. ALL EXISTING RECEPTACLES IN SHELTER AND SLEEPING ROOMS TO BE REPLACED WITH AFCI TYPE.
7. EXISTING HEATING BOILER SYSTEMS TO REMAIN.
8. DISCONNECT EXISTING ELECTRICAL COMPONENTS (UNDER CABINET LIGHTING, STOVE, FAN & FRIDGE), AND REMOVE CONNECTIONS/RECEPTACLES TO FIT THE SPACE AS SHOWN.
9. RELOCATE EXISTING TWO COUNTER DUPLEX RECEPTACLES CONNECTIONS TO REGULAR RECEPTACLE HEIGHT. REPLACE EXISTING RECEPTACLES WITH AFCI TYPE.
10. EXISTING POWER FOR WASHER & DRYER TO REMAIN.
11. ALL EXISTING RECEPTACLES IN SLEEPING ROOMS OR DWELLING UNITS TO BE REPLACED WITH AFCI TYPE TAMPER RESISTANT RECEPTACLES. BUDGET 1.5 PER SLEEPING ROOM AND 12 PER DWELLING UNIT.
12. NOTED LOCATION IS FOR IT HUB. PROVIDE NEW RECEPTACLE ON DEDICATED CIRCUIT FROM EXISTING FLOOR PANEL. PROVIDE TWO 1" CONDUITS FROM THIS LOCATION TO CORRIDOR CEILING SPACE. PROVIDE 3" CONDUIT FROM THIS LOCATION TO BASEMENT IT ROOM.
13. CONTRACTOR IS TO PROVIDE 16MM CONDUIT BETWEEN PUSHBUTTONS AND DOOR OPERATOR AND PROVIDE NOTED POWER CONNECTION TO OPERATOR. COORDINATE WITH SHOP DRAWINGS AND DOOR HARDWARE SUPPLIER PRIOR TO ROUGH-IN.
14. REPLACE EXISTING POWER CONNECTIONS TO SUIT THE INSTALLATION OF A COMBO STACKED WASHER-DRYER. REMOVE EXISTING 30A, 2P & 15A, 1P RECEPTACLES. FEED AND REPLACE WITH TWO 40A, 2P FEEDS. POWER FROM NEAREST AVAILABLE PANEL WITH CAPACITY.
15. PROVIDE NEW RECEPTACLE IN JANITOR ROOM FOR DETERGENT SYSTEM. POWER FROM NEAREST PANEL WITH NEW 15A, 1P BREAKER.
16. DS.2, DS.3, & DS.4 ARE POWERED FROM CONDENSERS ON ROOF.

1 SECOND FLOOR - FLOOR PLAN  
1/8"=1'-0"



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T	ISSUED FOR PERMIT & TENDER	2024.12.19
2	ISSUED FOR 90% REVIEW	2024.12.12
1	ISSUED FOR 30% REVIEW	2024.12.05
No	REVISION	DATE

**MIGHTON ENGINEERING**

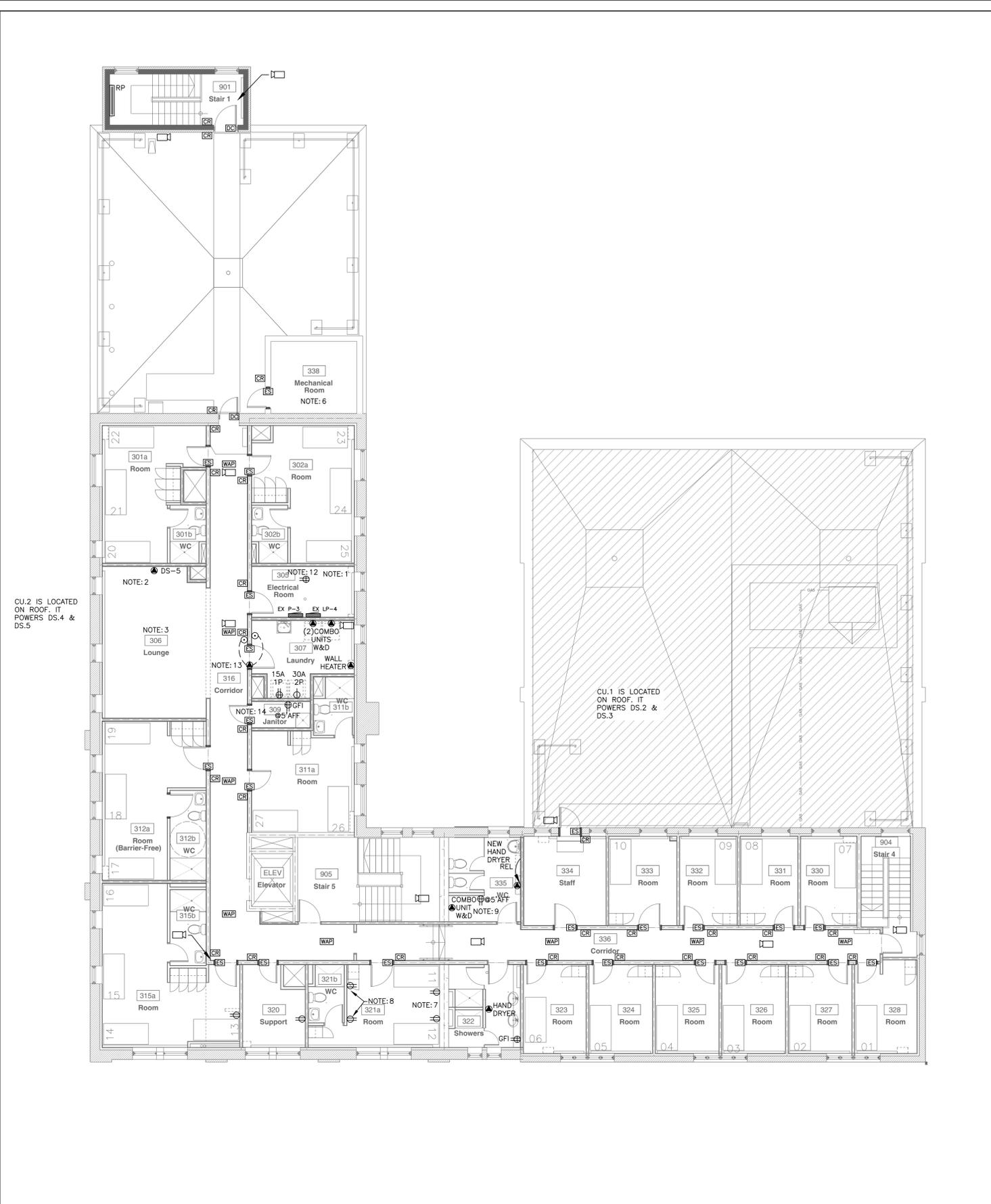
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PROJECT TITLE:  
**ROW - 84 FREDERICK ST.  
RENOVATION & RENEWAL**  
84 FREDERICK ST.  
KITCHENER, ON

DRAWING TITLE:  
**POWER & COMMUNICATIONS  
SECOND FLOOR - FLOOR PLAN**

DRAWN BY: D.Z.	CUSTOMER PROJECT No. -
CHECKED BY: M.J.	MIGHTON PROJECT No. 45061
DATE: DECEMBER 2024	DRAWING No. E7
SCALE: AS NOTED	

1 THIRD FLOOR - FLOOR PLAN  
1/8"=1'-0"



**POWER NOTES:**

- REMOVE EXISTING WASHING MACHINES AND DRYERS RECEPTACLES. REUSE POWER FEED TO NEW LOCATIONS IN LAUNDRY ROOM.
- DISCONNECT AND REMOVE EXISTING EXHAUST FAN & SWITCH IN INDICATED ROOM, INSTALL COVER PLATE.
- REPLACE ALL EXISTING RECEPTACLES WITH AFCI DUPLEX RECEPTACLES IN INDICATED ROOM.
- REMOVE ANY RECEPTACLES AND LIGHT SWITCHES THAT ARE IN THE EXISTING CORRIDOR WALL SECTION OF THIS ROOM TO ENLARGE THE WALL OPENING. COORDINATE THE INSTALLATION OF NEW RECEPTACLES AND LIGHT SWITCHES WITH OWNER PRIOR ELECTRICAL ROUGH-INS.
- ALL EXISTING RECEPTACLES IN SHELTER AND SLEEPING ROOMS TO BE REPLACED WITH AFCI TYPE.
- EXISTING HEATING BOILER SYSTEMS TO REMAIN.
- DISCONNECT EXISTING ELECTRICAL COMPONENTS (UNDER CABINET LIGHTING, STOVE, FAN & FRIDGE), AND REMOVE CONNECTIONS/RECEPTACLES TO FIT THE SPACE AS SHOWN.
- RELOCATE EXISTING TWO COUNTER DUPLEX RECEPTACLES CONNECTIONS TO REGULAR RECEPTACLE HEIGHT. REPLACE EXISTING RECEPTACLES WITH AFCI TYPE.
- REPLACE EXISTING POWER CONNECTIONS TO SUIT THE INSTALLATION OF A COMBO STACKED WASHER-DRYER. REMOVE EXISTING 30A,2P & 15A,1P RECEPTACLES. FEED AND REPLACE WITH TWO 40A,2P FEEDS. POWER FROM NEAREST AVAILABLE PANEL WITH CAPACITY.
- ALL EXISTING RECEPTACLES IN SLEEPING ROOMS OR DWELLING UNITS TO BE REPLACED WITH AFCI TYPE TAMPER RESISTANT RECEPTACLES. BUDGET 1.5 PER SLEEPING ROOM AND 12 PER DWELLING UNIT.
- ALL EXISTING ROOFTOP EQUIPMENT TO BE DISCONNECT AND RECONNECTED TO SUIT ROOFING WORK. REFER TO ROOF DRAWINGS FOR EXACT LOCATIONS. TOTAL OF FIVE UNITS.
- NOTED LOCATION IS FOR IT HUB. PROVIDE NEW RECEPTACLE ON DEDICATED CIRCUIT FROM EXISTING FLOOR PANEL. PROVIDE TWO 1" CONDUITS FROM THIS LOCATION TO CORRIDOR CEILING SPACE. PROVIDE 3" CONDUIT FROM THIS LOCATION TO BASEMENT IT ROOM.
- CONTRACTOR IS TO PROVIDE 16MM CONDUIT BETWEEN PUSHBUTTONS AND DOOR OPERATOR AND PROVIDE NOTED POWER CONNECTION TO OPERATOR. COORDINATE WITH SHOP DRAWINGS AND DOOR HARDWARE SUPPLIER PRIOR TO ROUGH-IN.
- PROVIDE NEW RECEPTACLE IN JANITOR ROOM FOR DETERGENT SYSTEM. POWER FROM NEAREST PANEL WITH NEW 15A,1P BREAKER.
- DS.5 IS POWERED FROM CONDENSER ON ROOF.
- PROVIDE POWER TO NEW CONDENSER UNITS ON ROOF FROM EXISTING PANELS WITH SPARE CAPACITY. PROVIDE NEW BREAKERS AND WIRING.

**ELECTRICAL SPECIFICATION**

- GENERAL
  - THE CANADIAN STANDARD FORM OF CONSTRUCTION CONTRACT AND GENERAL CONDITIONS GOVERNING THE SAME CCDC PARTS 1 TO 12 INCLUSIVE ARE HEREBY MADE A PART OF THIS SPECIFICATION.
  - THIS CONTRACTOR IS REQUIRED TO PAY ALL FEES TO THE ESA FOR FIELD INSPECTION. THIS CONTRACTOR SHALL MAINTAIN LIABILITY INSURANCE AS REQUIRED.
  - ALL WORKMANSHIP SHALL BE EXECUTED TO A STANDARD DETERMINED BY GOOD PRACTICE. THE ELECTRICAL CONTRACTOR SHALL GUARANTEE THE INSTALLATION FOR ONE YEAR FROM SUBSTANTIAL COMPLETION OF THE WORK.
  - THE ELECTRICAL CONTRACTOR SHALL SUBMIT ONE SET OF ELECTRONIC PDF SHOP DRAWINGS TO THE ARCHITECT. MATERIALS SHALL NOT BE ORDERED UNTIL REVIEW HAS BEEN COMPLETED. APPROVAL IS FOR GENERAL DESIGN AND ARRANGEMENT ONLY. THE OWNERS RESERVE THE RIGHT TO ALTER THE LOCATION OF ANY ITEM UP TO TEN FEET (3m) WITHOUT INCURRING EXTRA COSTS, PROVIDED THE REQUEST IS MADE PRIOR TO INSTALLATION.
  - ALL MATERIAL AND EQUIPMENT USED ON THIS PROJECT SHALL BE C.S.A. APPROVED, ESA FIELD EVALUATED, OR MUST BEAR AN ESA RECOGNIZED CERTIFICATION MARK.
  - ALL CUTTING AND PATCHING FOR ELECTRICAL WORK SHALL BE DONE BY THE GENERAL CONTRACTOR AT THE ELECTRICAL CONTRACTOR'S EXPENSE.
  - THE DRAWINGS AND SPECIFICATIONS SHALL BE READ IN CONJUNCTION WITH THE ARCHITECTURAL AND MECHANICAL DRAWINGS AND SPECIFICATIONS. ANY DISCREPANCIES OR CONTRADICTIONS SHALL BE BROUGHT TO THE CONSULTANT'S ATTENTION.
  - ALL TEMPORARY LIGHTING AND POWER DURING CONSTRUCTION SHALL BE BY THE GENERAL CONTRACTOR AFTER AGREEMENT WITH THE ELECTRICAL CONTRACTOR. POWER SHALL BE PROVIDED FROM PANELS WITH REQUIRED SUPPLY AND CAPACITY.
  - TENDER SHALL BE BASED UPON THE SPECIFIED EQUIPMENT AND MATERIAL. REQUESTS FOR CONSIDERATION OF ALTERNATES TO THE SPECIFIED MATERIALS SHALL BE MADE TO THE CONSULTANT ONE WEEK PRIOR TO TENDER CLOSING AND SHALL INCLUDE MANUFACTURER, MODEL, AND COST MODIFICATION. COSTS OF ANY CHANGE REQUIRED TO OTHER TRADES AS A RESULT OF USING ALTERNATE EQUIPMENT ARE TO BE INCURRED BY THE ELECTRICAL CONTRACTOR.
  - ALL CLAIMS FOR EXTRA WORK NOT COVERED IN THE CONTRACT TO BE SUBMITTED WITH A COMPLETE BREAKDOWN OF MATERIAL AND LABOUR.
  - DO NOT SCALE THESE DRAWINGS. ALL DIMENSIONS ARE TO BE TAKEN FROM THE ARCHITECTURAL DRAWINGS AND CONFIRMED ON SITE.
  - ALL OVERTIME WORK SHALL BE CARRIED OUT WITH NO ADDITIONAL COST TO THE OWNER.
  - PROVIDE FIRE STOPPING PROTECTION FOR OPENINGS THROUGH FIRE RATED WALLS, FLOORS AND ROOF. U.L.C. LISTED ASSEMBLY NUMBERS ARE TO BE USED.
- ELECTRICAL EQUIPMENT
  - ALL BRANCH CIRCUIT WIRING SHALL BE RUN IN ELECTRICAL METALLIC TUBING (E.M.T.) OR FLEXIBLE ARMORED CABLE (AC90) RECESSED IN WALLS OR CEILINGS EXCEPT WHERE SPECIFICALLY NOTED ON THE PLANS. NO WIRING SMALLER THAN #12 GAUGE SHALL BE USED. ALL WIRING TO BE COPPER.
  - ALL SURFACE WIRING SHALL BE #10 COPPER IN EMT CONDUIT WHERE WIRING AND CONDUIT CANNOT BE RECESSED.
  - ALL BELOW GRADE WIRING SHALL BE RW90 COPPER IN RIGID PVC CONDUIT UNLESS OTHERWISE NOTED.
  - THE ELECTRICAL SERVICE EQUIPMENT, EACH METALLIC PIPING SYSTEM, AND EACH CONDUIT SYSTEM SHALL BE PERMANENTLY AND EFFECTIVELY GROUNDED/BONDED IN ACCORDANCE WITH THE ONTARIO ELECTRICAL SAFETY CODE.
  - ALL ELECTRICAL PANELS TO HAVE BOLT-ON BREAKERS AND LOCKABLE DOORS.
  - ALL ELECTRICAL DISTRIBUTION EQUIPMENT MUST BE PROPERLY IDENTIFIED WITH LAMACOID NAME PLATES SCREWED ON EQUIPMENT. PANELS ARE TO HAVE TYPED DIRECTORIES. DISCONNECTS ARE TO HAVE MAXIMUM FUSE RATINGS INDICATED. THE ELECTRICAL CONTRACTOR SHALL SUPPLY ALL LABOUR AND MATERIALS TO PROVIDE ELECTRIC SERVICE COMPLETE WITH FEEDERS AND BRANCH CIRCUITS ALL AS SHOWN ON THE PLANS.
  - EXTRA CHARGES FOR PREMIUM TIME LABOUR SHALL BE INCLUDED IN THE TENDER PRICE, ALLOWING FOR AFTER HOURS, WEEKEND AND HOLIDAY LABOUR REQUIREMENTS.
  - ALL JUNCTION AND PULLING BOXES ARE TO BE ACCESSIBLE AND BE PROVIDED WITH SCREWED PLATES COLOUR MATCHED TO ADJACENT WALL OR CEILING FINISHES.
  - PULL BOXES SHALL BE PROVIDED EVERY 30m AND EVERY 20 90° BENDS.
  - ALL WIRING SHALL BE PARALLEL WITH ARCHITECTURAL LINES AND DESIGN.
  - PROVIDE A PULL STRING IN ALL EMPTY CONDUIT.
  - FLEXIBLE CONDUIT SHALL BE USED FOR FIXTURE AND EQUIPMENT CONNECTIONS.
  - ALL NEW SWITCH AND RECEPTACLE PLATES SHALL BE WHITE. ALL DEVICES TO BE COMMERCIAL GRADE DECORA SERIES. DEVICES AND COVER PLATES ARE TO MATCH EXISTING STYLE FOR RENOVATED AREAS.
  - DEVICE MOUNTING HEIGHT TO CENTRE OF DEVICE IS AS FOLLOWS:
 

2.15.1. LIGHT SWITCHES	1100mm
2.15.2. RECEPTACLE	400mm
2.15.3. FIRE ALARM HORN	2300mm
2.15.4. FIRE ALARM HORN/STROBE	2300mm
2.15.5. MANUAL STATION	1200mm
2.15.6. END OF LINE RESISTORS	1700mm
2.15.7. UNIVERSAL WASHROOM CONTROL	1000mm
2.15.8. UNIVERSAL WASHROOM AUDIBLE/VISUAL	2300mm
2.15.9. POWER DOOR OPERATORS	1000mm
2.15.10. OTHER BUILDING CONTROLS	1000mm
  - ALL AUDIBLE FIRE ALARM DEVICES MUST BE AT LEAST 150mm BELOW CEILING.
  - DEVICE MOUNTING HEIGHT TO BOTTOM OF DEVICE IS AS FOLLOWS:
 

2.16.1. BASEBOARD HEATER	100mm
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  - DO NOT MOUNT WALL OUTLETS BACK TO BACK IN WALLS, STAGGER TO PREVENT SOUND TRANSFER.
  - ALL RECEPTACLES LOCATED WITHIN 1500mm OF A SINK ARE TO BE PROVIDED WITH AN INTEGRAL CLASS A GROUND FAULT CIRCUIT INTERRUPTER.
  - WIRING TO FIXTURES IN SUSPENDED CEILINGS IS TO CONSIST OF AC90 'DROPS' WITH A MAXIMUM LENGTH OF 4.5m (15 FT) AND 190 WIRING IN EMT CONDUIT BACK TO SOURCE PANEL.
  - ALL CONDUITS AND CABLES TO BE SECURELY FASTENED WITH APPROVED CLIPS AND SCREWS. NAILS OR THE WIRES ARE NOT ACCEPTABLE.
  - ALL ELECTRICAL EQUIPMENT, DEVICES, AND WIRING ARE TO BE INDEPENDENTLY SUPPORTED. KEEP CLEAR OF MECHANICAL PIPING WHERE POSSIBLE.
  - WIRING FOR MECHANICAL EQUIPMENT SHALL BE AS DETAILED ON THE PLANS.
  - THE ELECTRICAL CONTRACTOR IS TO PROVIDE 21mm (3/4") CONDUIT RACEWAY BETWEEN MECHANICAL EQUIPMENT AND CONTROLS AS PER MECHANICAL AND ELECTRICAL PLANS.
- LIGHT FIXTURES
  - ELECTRICAL CONTRACTOR SHALL INSTALL ALL FIXTURES AND LAMPS AS PER THE MANUFACTURERS SPECIFICATIONS.
  - ALL LED LAMPS ARE TO HAVE A COLOUR TEMPERATURE OF 3500K UNLESS OTHERWISE NOTED.
  - INSTALL ALL FIXTURES PARALLEL WITH BUILDING LINES UNLESS INDICATED OTHERWISE.
  - EXIT FIXTURES ARE TO BE PROVIDED WITH GRAPHICAL SYMBOLS INDICATING THE PATH OF EGRESS FROM THE BUILDING.
  - INSTALL A SEPARATE NEUTRAL CONDUCTOR TO EACH BRANCH CIRCUIT FEEDING LIGHT FIXTURES.
  - THE ELECTRICAL CONTRACTOR SHALL SUPPLY AND INSTALL LIGHTING FIXTURES AS NOTED ON THE PLANS.
  - THE ELECTRICAL CONTRACTOR SHALL SUPPLY AND INSTALL A DC BATTERY LIGHTING SYSTEM AS INDICATED ON THE PLANS. THE BATTERY UNIT SHALL BE PROVIDED WITH SEALED LONG LIFE BATTERIES.
  - EMERGENCY LIGHTING FIXTURES ARE TO BE SUPPLIED WITH MINIMUM 4W LED MR16 LAMPS OR 3W LED PAR18 LAMPS UNLESS LISTED OTHERWISE.
  - COMMUNICATION EQUIPMENT
    - THE ELECTRICAL CONTRACTOR IS TO PROVIDE ALL MATERIALS AND LABOUR FOR A COMPLETE EMPTY CONDUIT SYSTEM FOR COMMUNICATION OUTLETS AS SHOWN ON THE PLANS.
    - PROVIDE 21mm (3/4") CONDUIT TO EACH OUTLET FROM COMMUNICATION BACKBOARD C/W NYLON PULL STRING IN ALL EMPTY CONDUITS.
    - COMMUNICATION BACKBOARD TO BE PLYWOOD, 21mm (3/4") THICK, WITH FIRE-RETARDANT PAINT AND #6 GREEN INSULATED GROUND WIRE TO MAIN BUILDING GROUND.
    - CONTACT BELL CANADA TO DETERMINE INCOMING SERVICE ROUTING.
  - FIRE ALARM
    - WHERE EXISTING, UNLESS NOTED OTHERWISE, FIRE ALARM TO BE KEPT.
    - ALL REQUIRED WORK RELATED COMMISSIONING OF LIFE SAFETY SYSTEMS SHALL BE DONE AT NO ADDITIONAL COSTS. RETAIN THE SYSTEM MANUFACTURER'S FORCES TO PERFORM THE FINAL CONNECTIONS, MODIFICATIONS, AND PROVISION OF NEW INTERFACING DEVICES, ETC.
    - THE ELECTRICAL CONTRACTOR IS TO ENSURE THAT ALL NEW LIFE SAFETY DEVICES ARE FULLY COMPATIBLE WITH EXISTING SYSTEM.
    - THE ELECTRICAL CONTRACTOR IS TO HAVE THE SYSTEM MANUFACTURER TEST AND CERTIFY THE LIFE SAFETY SYSTEM FOR PROPER OPERATION AT THE COMPLETION OF WORK.
    - FIRE ALARM SYSTEM TO BE INSTALLED IN CONFORMANCE WITH CAN/ULC-S524-M, "INSTALLATION OF FIRE ALARM SYSTEMS"
    - FIRE ALARM SYSTEM TO BE VERIFIED IN CONFORMANCE WITH CAN/ULC-S537-M, "VERIFICATION OF FIRE ALARM SYSTEMS", TO ENSURE SATISFACTORY OPERATION.
    - NOTIFICATION OF THE FIRE DEPARTMENT TO BE BY WAY OF SIGNALS TO A CENTRAL STATION CONFORMING TO CAN/ULC-S561, "INSTALLATION AND SERVICES FOR FIRE SIGNAL RECEIVING CENTRES AND SYSTEMS" OR TO THE MUNICIPAL FIRE ALARM SYSTEM.
  - EXISTING CONDITIONS
    - THE CONTRACTOR SHALL VISIT THE SITE AND EXAMINE THE EXISTING CONDITIONS AND THEN MAKE NECESSARY ALLOWANCES IN HIS TENDER PRICE FOR REMOVAL, RELOCATION, REROUTING AND/OR RECONNECTION OF EXISTING ELECTRICAL EQUIPMENT AND WIRING, AS MAY BE NECESSARY FOR THE EXECUTION AND COMPLETION OF THIS PROJECT.
    - ELECTRICAL WORK AFFECTING OTHER TENANTS IS TO BE PERFORMED AFTER BUSINESS HOURS (EVENINGS AND WEEKENDS). COORDINATE WITH LANDLORD.
    - SERVICE AND DISTRIBUTION SYSTEM POWER INTERRUPTIONS SHALL BE KEPT TO A MINIMUM. POWER INTERRUPTIONS MUST BE COORDINATED WITH THE OWNER AND ALL OTHER TRADES BY THIS CONTRACTOR. WRITTEN APPROVAL FOR ELECTRICAL INTERRUPTIONS MUST BE RECEIVED FROM THE OWNER INDICATING THE DATE, TIME AND ESTIMATED DURATION OF THE INTERRUPTION. APPLICATION FOR APPROVAL OF THE POWER INTERRUPTIONS MUST BE SUBMITTED TO THE OWNERS AND/OR ARCHITECTS AT LEAST TWO WEEKS PRIOR TO THE REQUEST SHUTDOWN DATE.
    - EXISTING ELECTRICAL EQUIPMENT, REMOVED AND INDICATED FOR REUSE, SHALL BE CLEANED, REPAIRED AND REPAINTED (IF REQUIRED) BEFORE RE-INSTALLATION.
    - WIRING LOCATED IN AREAS BEING ALTERED OR DEMOLISHED, BUT FEEDING OUTLETS OR EQUIPMENT REQUIRED TO REMAIN IN SERVICE, MUST BE REWORKED IN ORDER TO MAINTAIN THE CONTINUITY OF THESE SERVICES.
    - REPAIRS TO EXISTING WALLS, FLOORS, AND CEILINGS ARE TO BE PERFORMED BY THE GENERAL CONTRACTOR TO MEET THE EXISTING CONDITIONS.
    - SEQUENCE OF REMOVAL AND RELOCATION OF EXISTING EQUIPMENT AND WIRING SHALL BE COORDINATED WITH THE OTHER TRADES AND SHALL CONFORM TO THE REQUIREMENTS AND CONDITIONS OUTLINED.
    - THE CONTRACTOR SHALL PROVIDE ADEQUATE PROTECTION TO EXISTING WIRING AND EQUIPMENT THROUGHOUT THE PROJECT, PARTICULARLY WHERE WIRING AND ELECTRICAL EQUIPMENT HAVE BECOME EXPOSED TO MECHANICAL DAMAGE OR MOISTURE IN THE COURSE OF ALTERATIONS OR NEW CONSTRUCTION.
    - IN SOME INSTANCES, NEW OUTLETS AND EQUIPMENT ARE SHOWN IN THE SAME LOCATION AS EXISTING OUTLETS. THESE ARE TO BE INSTALLED THROUGH THE EXISTING CONDUITS PROVIDED THAT THE CONDUITS AND WIRING ARE IN GOOD CONDITION AND ARE ACCEPTABLE TO THE ESA INSPECTION DEPARTMENT AS REUSABLE. ALL UNUSED CONDUIT ENTRANCE OPENINGS SHALL BE SEALED.
  - DEMOLITION
    - ALL EXISTING ELECTRICAL EQUIPMENT, WIRING, DATA CABLES, AND ROUGH-IN DEVICES ARE TO BE REMOVED COMPLETE TO SUIT THE DEMOLITION AND RENOVATION OF THE SPACES. ALL EXISTING ELECTRICAL EQUIPMENT, WHICH IS NOT BEING REUSED, SHALL BECOME THE PROPERTY OF THE OWNER. IF THE OWNER DECIDES THAT HE DOES NOT WANT IT, THE ELECTRICAL CONTRACTOR WILL BE RESPONSIBLE FOR DISPOSING OF IT. REMOVE AND TRANSPORT FROM THE CONSTRUCTION SITE ALL EQUIPMENT MADE OBSOLETE CONSECUTIVE TO THE WORK.
    - PROVIDE CONSULTANT WITH RECEIPT INDICATING SUCH ITEMS HAVE BEEN DISPOSED OF SAFELY.
  - CLOSE OUT PROCEDURES
    - ELECTRICAL CONTRACTOR TO SUBMIT FIRE ALARM SYSTEM VERIFICATION AND TESTING REPORTS (INCLUDING DEVICE REPORT); FIRE ALARM MONITORING CERTIFICATION; ESA CERTIFICATE OF INSPECTIONS; AND SIGNED COPY OF EMERGENCY LIGHTING TEST REPORT.
    - EMERGENCY LIGHTING TEST REPORT TO PROVIDE WRITTEN VERIFICATION THAT THE EMERGENCY LIGHTING WAS TESTED TO DETERMINE THE RUNTIME OF THE LIGHTING WHEN NORMAL POWER IS LOST.
    - ELECTRICAL CONTRACTOR TO PROVIDE TRAINING SESSIONS TO THE OWNER ON ALL MAJOR ELECTRICAL SYSTEMS INCLUDING LIGHTING CONTROLS.
    - ELECTRICAL CONTRACTOR IS TO PROVIDE RECORD DRAWINGS OF ACTUAL INSTALLATION TO OWNERS WITHIN 30 DAYS OF PROJECT COMPLETION. DRAWINGS ARE TO INCLUDE SINGLE LINE DIAGRAM OF DISTRIBUTION SYSTEM AND FLOOR PLANS SHOWING THE LOCATION OF DISTRIBUTION EQUIPMENT AND THE AREAS SERVED BY THAT EQUIPMENT.
    - AFTER COMPLETION OF WORK REMOVE ALL DEBRIS AND WASTE.
    - LIGHTING CONTROL SYSTEM TESTING IS TO INCLUDE OCCUPANCY SENSOR PLACEMENT, SENSITIVITY, AND CONTROL SETTING CALIBRATION. PROPERLY OPERATING OCCUPANCY SENSORS ARE TO TURN OFF LIGHTS WITHIN A REASONABLE PERIOD OF TIME IN UNOCCUPIED SPACES AND SHALL NOT TURN LIGHTS ON UNLESS A SPACE IS OCCUPIED. ALL LIGHTING CONTROL SYSTEM TESTING IS TO BE PERFORMED BY MANUFACTURERS REPRESENTATIVE AT ELECTRICIAN'S EXPENSE. TESTING CERTIFICATION IS TO BE INCLUDED IN CLOSE-OUT DOCUMENTS.
  - INSPECTIONS BY CONSULTANT
    - CONTRACTOR TO CONTACT CONSULTANTS OFFICE TO NOTIFY WHEN INSPECTIONS ARE REQUIRED. ALLOW FOR MINIMUM THREE BUSINESS DAYS OF NOTICE PRIOR TO INSPECTION.
    - INSPECTIONS ARE REQUIRED AT THE FOLLOWING MILESTONES:
      - 2.9.2.1. DEVICE ROUGH-IN (PRIOR TO DRYWALL)
      - 2.9.2.2. DEFICIENCY INSPECTION A (TWO WEEKS PRIOR TO FINAL)
      - 2.9.2.3. DEFICIENCY INSPECTION B (ONE WEEK PRIOR TO FINAL)
      - 2.9.2.4. FINAL INSPECTION



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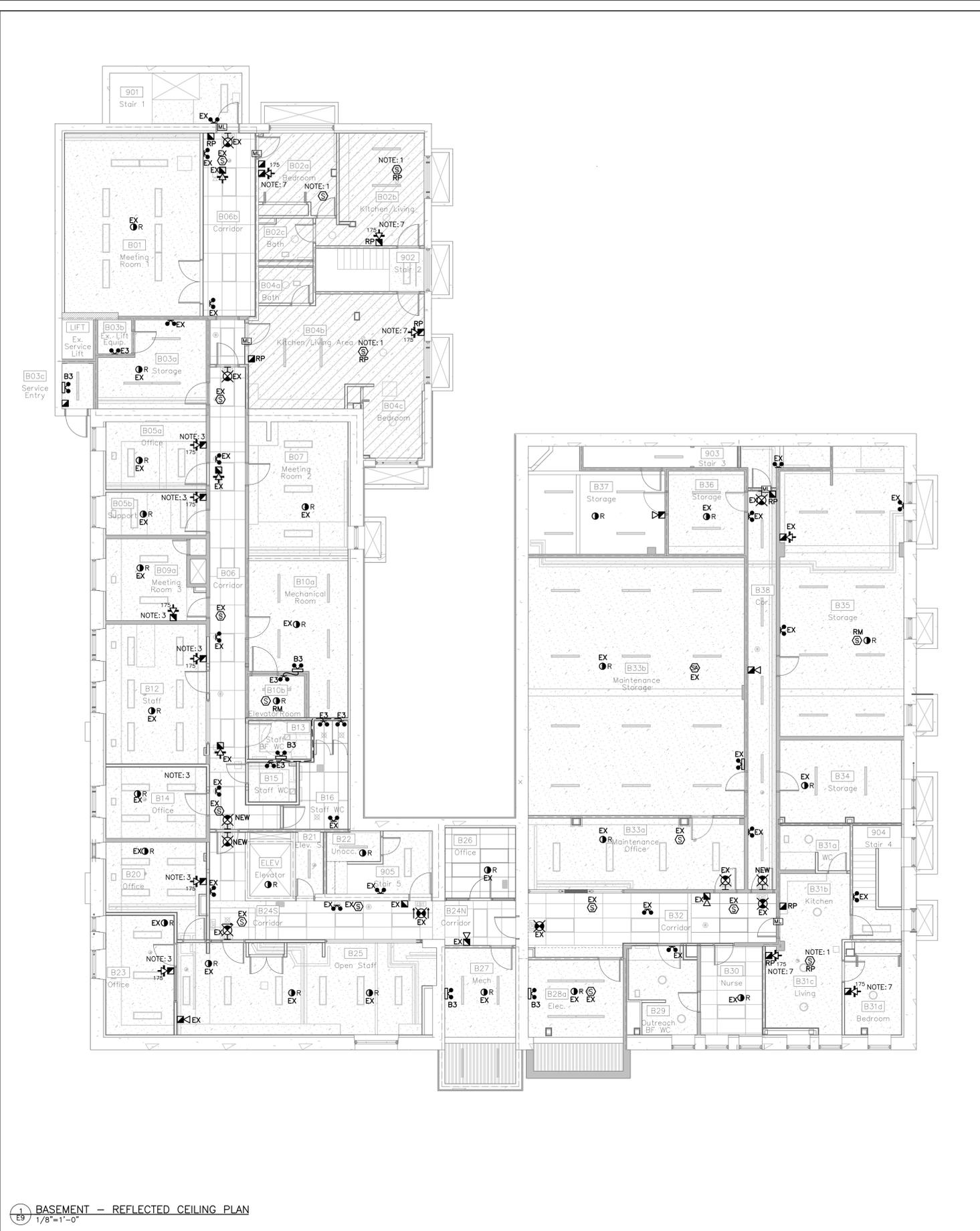
**MIGHTON ENGINEERING**  
493 LANCASTER ST. W. UNIT 204 PH (519) 745-3703  
KITCHENER, ON N2K 1L8 WEB www.mighton.com

PROJECT TITLE:  
**ROW - 84 FREDERICK ST. RENOVATION & RENEWAL**

84 FREDERICK ST.  
KITCHENER, ON

DRAWING TITLE:  
**POWER & COMMUNICATIONS THIRD FLOOR - FLOOR PLAN**

DRAWN BY:	D.Z.	CUSTOMER PROJECT No.	-
CHECKED BY:	M.J.	MIGHTON PROJECT No.	45061
DATE:	DECEMBER 2024	DRAWING No.	E8
SCALE:	AS NOTED		



- FIRE ALARM & LIFE SAFETY NOTES:**
1. REPLACE EXISTING HEAT DETECTOR WITH NEW ADDRESSABLE SMOKE DETECTOR. ALL SMOKE DETECTORS TO BE MAPPED TO ROOM NAMES AND DISPLAYED AT THE ANNUNCIATOR AS THEIR ROOM NAME. UPON ACTIVATION OF SMOKE DETECTOR LOCAL ROOM HORN/STROBE TO ACTIVATE. REMOVE EXISTING BATTERY SMOKE ALARM.
  2. CONNECT ALL EMERGENCY FIXTURES TO LINE SIDE OF LOCAL LIGHTING CIRCUIT.
  3. NOTED SIGNALLING DEVICE TO BE ON SEPARATE CLASS A LOOP TO SUPPORT FUTURE CONVERSION TO SLEEPING ROOM.
  4. INDICATED LIGHTING FIXTURE TO BE WALL MOUNTED.
  5. EXISTING PULL STATIONS TO BE REPLACED WHERE NEW ELECTROMAGNETIC LOCKS ARE BEING INSTALLED.
  6. ENSURE ALL EXISTING HEAT DETECTORS ARE CURRENT AND IN GOOD WORKING ORDER. REPLACE ALL OBSOLETE HEAT DETECTORS.
  7. NEW HORN/STROBE UNIT TO BE INSTALLED IN NOTED RESIDENTIAL SPACES. DEVICE TO BE CONNECTED TO A NEW CLASS A SIGNAL CIRCUIT. UNIT TO BE SOUNDED ON GENERAL ALARM OR UPON ACTIVATION OF IN ROOM SMOKE DETECTOR. REFER TO FIRE ALARM RISER FOR MORE DETAILS.

- MAGLOCK NOTES:**
- A. DOORS CONTROLLED BY MAGNETIC LOCKS SHALL HAVE A LEGIBLE SIGN PERMANENTLY MOUNTED ON THEM WITH THE WORDS "EMERGENCY EXIT UNLOCKED BY FIRE ALARM". THE LETTERING FOR THIS SIGN SHALL BE AT LEAST 1" HIGH WITH A 3/16" STROKE AS REQUIRED BY DIVISION B ARTICLE 3.4.6.16. OF THE 2012 ONTARIO BUILDING CODE.
  - B. MANUAL PULL STATION TO BE C/W AUXILIARY CONTACT FOR ELECTROMAGNETIC LOCK. LOCATE THE MANUAL PULL STATION A MINIMUM OF 405mm FROM BARRIER-FREE OBSTRUCTIONS AND A MAXIMUM OF 600mm FROM THE DOOR.
  - C. EXISTING EXITS TO REMAIN.
  - D. COORDINATE EXACT LOCATION OF CARD READERS ON SITE WITH SECURITY INSTALLERS AND OWNERS REPRESENTATIVE PRIOR TO ROUGH-IN.
  - E. CONNECT NEW EXIT SIGNS TO EXISTING EXIT SIGN CIRCUIT.
  - F. MOTION SENSORS BY MAGLOCK INSTALLER.
  - G. EXISTING EMERGENCY LIGHTING TO REMAIN.
  - H. VERIFY EXACT LOCATION OF MANUAL OVERRIDE SWITCH ON SITE. PROVIDE 3/4" CONDUIT FROM POWER SUPPLY TO OVERRIDE LOCATIONS. WIRING AND BUTTON BY SECURITY INSTALLER.
  - I. PROVIDE ROUGH-IN AND WIRING FOR ALL DOOR ACCESS HARDWARE, CARD READERS, MAGNETIC LOCKING DEVICES AND LOW VOLTAGE TRANSFORMERS (REFER TO ARCHITECTURAL PLANS FOR REQUIREMENTS). CONFIRM FINAL LAYOUT AND WIRING REQUIREMENTS WITH DOOR HARDWARE SHOP DRAWINGS PRIOR TO RELATED WORK.
  - J. LOCATE MANUALLY OPERATED SWITCH ADJACENT TO BUILDING ANNUNCIATOR PANEL OR TIE INTO EXISTING MAGLOCK BYPASS SWITCH. SWITCH TO BE KEYPED OR ACCESSIBLE ONLY TO AUTHORIZED PERSONNEL.
  - K. ELECTROMAGNETIC LOCK IS TO RELEASE UNDER THE FOLLOWING CONDITIONS:
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    - K.B. LOSS OF POWER CONTROLLING THE ELECTROMAGNETIC LOCK.
    - K.C. ACTUATION OF MANUALLY OPERATED SWITCH AT BUILDING ENTRY.
    - K.D. ACTUATION OF MANUAL PULL STATION.
    - K.E. FAULT DETECTED BETWEEN FIRE ALARM CONTROL PANEL AND THE LOCKING DEVICE CONTROLLER.
    - K.F. SIGNAL FROM CARD READER.

1 BASEMENT - REFLECTED CEILING PLAN  
1/8"=1'-0"



4		
3		
T	ISSUED FOR PERMIT & TENDER	2024.12.19
2	ISSUED FOR 90% REVIEW	2024.12.12
1	ISSUED FOR 30% REVIEW	2024.12.05
No	REVISION	DATE

**MIGHTON ENGINEERING**

493 LANCASTER ST. W. UNIT 204 PH (519) 745-3703  
KITCHENER, ON N2K 1L8 WEB www.mighton.com

PROJECT TITLE:  
**ROW - 84 FREDERICK ST. RENOVATION & RENEWAL**  
 84 FREDERICK ST.  
 KITCHENER, ON  
 DRAWING TITLE:  
**FIRE ALARM & LIFE SAFETY BASEMENT - RCP**

DRAWN BY: D.Z.	CUSTOMER PROJECT No. -
CHECKED BY: M.J.	MIGHTON PROJECT No. 45061
DATE: DECEMBER 2024	DRAWING No. E9
SCALE: AS NOTED	



1 GROUND FLOOR - REFLECTED CEILING PLAN  
1/8"=1'-0"

**FIRE ALARM & LIFE SAFETY NOTES:**

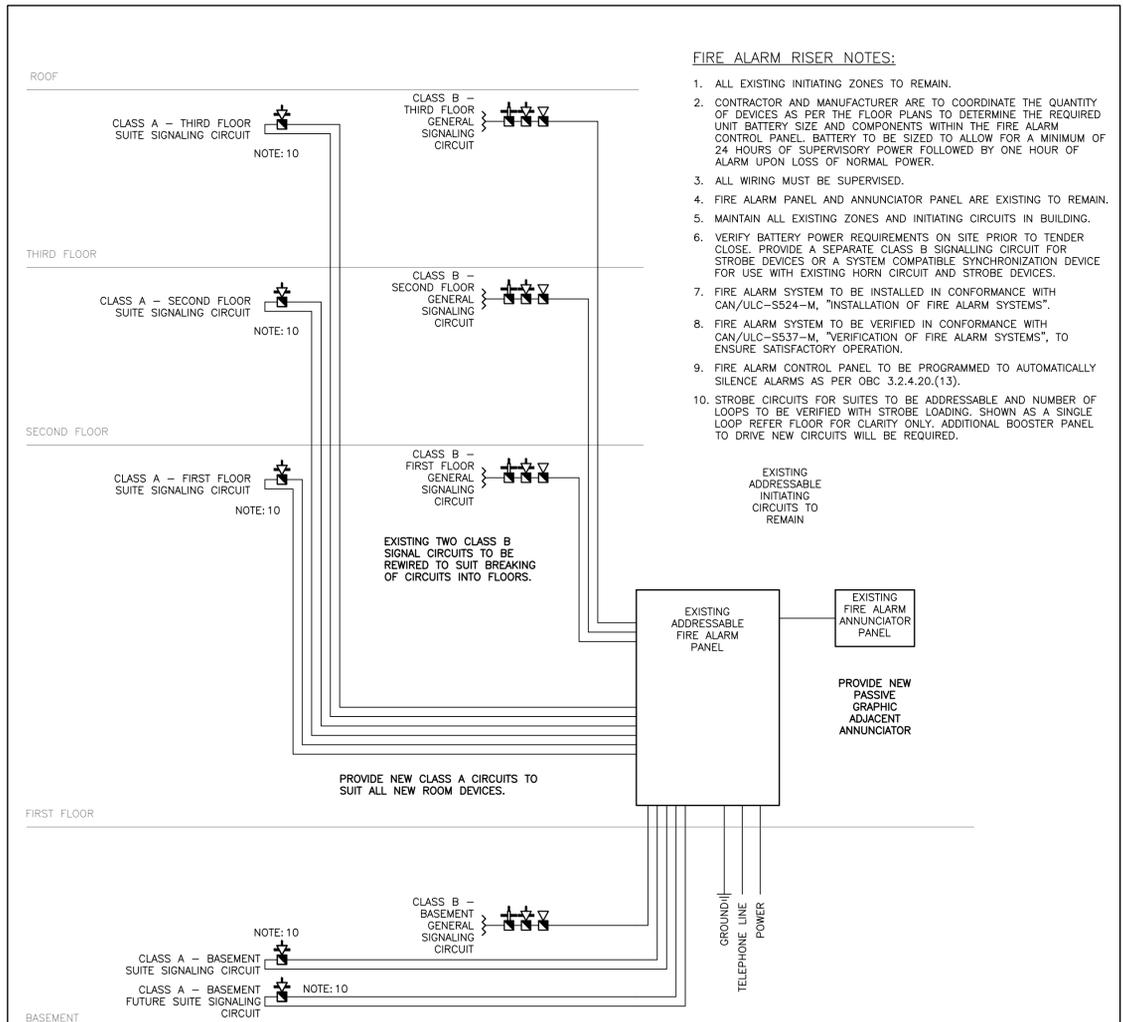
1. CONNECT ALL EMERGENCY FIXTURES TO LINE SIDE OF LOCAL LIGHTING CIRCUIT.
2. EXISTING PULL STATIONS TO BE REPLACED WHERE NEW ELECTROMAGNETIC LOCKS ARE BEING INSTALLED.
3. ENSURE ALL EXISTING HEAT DETECTORS ARE CURRENT AND IN GOOD WORKING ORDER. REPLACE ALL OBSOLETE HEAT DETECTORS.
4. REPLACE EXISTING HEAT DETECTOR WITH NEW ADDRESSABLE SMOKE DETECTOR. ALL SMOKE DETECTORS TO BE MAPPED TO ROOM NAMES AND DISPLAYED AT THE ANNUNCIATOR AS THEIR ROOM NAME. UPON ACTIVATION OF SMOKE DETECTOR LOCAL ROOM HORN/STROBE TO ACTIVATE. REMOVE EXISTING BATTERY SMOKE ALARM.
5. NEW HORN/STROBE UNIT TO BE INSTALLED IN NOTED RESIDENTIAL SPACES. DEVICE TO BE CONNECTED TO A NEW CLASS A SIGNAL CIRCUIT. UNIT TO BE SOUNDED ON GENERAL ALARM OR UPON ACTIVATION OF IN ROOM SMOKE DETECTOR. REFER TO FIRE ALARM RISER FOR MORE DETAILS.

**MAGLOCK NOTES:**

- A. DOORS CONTROLLED BY MAGNETIC LOCKS SHALL HAVE A LEGIBLE SIGN PERMANENTLY MOUNTED ON THEM WITH THE WORDS "EMERGENCY EXIT UNLOCKED BY FIRE ALARM". THE LETTERING FOR THIS SIGN SHALL BE AT LEAST 1" HIGH WITH A 3/16" STROKE AS REQUIRED BY DIVISION B ARTICLE 3.4.6.16. OF THE 2012 ONTARIO BUILDING CODE.
- B. MANUAL PULL STATION TO BE C/W AUXILIARY CONTACT FOR ELECTROMAGNETIC LOCK. LOCATE THE MANUAL PULL STATION A MINIMUM OF 405mm FROM BARRIER-FREE OBSTRUCTIONS AND A MAXIMUM OF 600mm FROM THE DOOR.
- C. EXISTING EXITS TO REMAIN.
- D. COORDINATE EXACT LOCATION OF CARD READERS ON SITE WITH SECURITY INSTALLERS AND OWNERS REPRESENTATIVE PRIOR TO ROUGH-IN.
- E. CONNECT NEW EXIT SIGNS TO EXISTING EXIT SIGN CIRCUIT.
- F. MOTION SENSORS BY MAGLOCK INSTALLER.
- G. EXISTING EMERGENCY LIGHTING TO REMAIN.
- H. VERIFY EXACT LOCATION OF MANUAL OVERRIDE SWITCH ON SITE. PROVIDE 3/4" CONDUIT FROM POWER SUPPLY TO OVERRIDE LOCATIONS. WIRING AND BUTTON BY SECURITY INSTALLER.
- I. PROVIDE ROUGH-IN AND WIRING FOR ALL DOOR ACCESS HARDWARE, CARD READERS, MAGNETIC LOCKING DEVICES AND LOW VOLTAGE TRANSFORMERS (REFER TO ARCHITECTURAL PLANS FOR REQUIREMENTS). CONFIRM FINAL LAYOUT AND WIRING REQUIREMENTS WITH DOOR HARDWARE SHOP DRAWINGS PRIOR TO RELATED WORK.
- J. LOCATE MANUALLY OPERATED SWITCH ADJACENT TO BUILDING ANNUNCIATOR CONTROL PANEL. BATTERY TO BE SIZED TO ALLOW FOR A MINIMUM OF 24 HOURS OF SUPERVISORY POWER FOLLOWED BY ONE HOUR OF ALARM UPON LOSS OF NORMAL POWER.
- K. ELECTROMAGNETIC LOCK IS TO RELEASE UNDER THE FOLLOWING CONDITIONS:
  - K.A. LOSS OF POWER TO THE FIRE ALARM CONTROL PANEL.
  - K.B. LOSS OF POWER CONTROLLING THE ELECTROMAGNETIC LOCK.
  - K.C. ACTUATION OF MANUALLY OPERATED SWITCH AT BUILDING ENTRY.
  - K.D. ACTUATION OF MANUAL PULL STATION.
  - K.E. FAULT DETECTED BETWEEN FIRE ALARM CONTROL PANEL AND THE LOCKING DEVICE CONTROLLER.
  - K.F. SIGNAL FROM CARD READER.

**FIRE ALARM RISER NOTES:**

1. ALL EXISTING INITIATING ZONES TO REMAIN.
2. CONTRACTOR AND MANUFACTURER ARE TO COORDINATE THE QUANTITY OF DEVICES AS PER THE FLOOR PLANS TO DETERMINE THE REQUIRED UNIT BATTERY SIZE AND COMPONENTS WITHIN THE FIRE ALARM CONTROL PANEL. BATTERY TO BE SIZED TO ALLOW FOR A MINIMUM OF 24 HOURS OF SUPERVISORY POWER FOLLOWED BY ONE HOUR OF ALARM UPON LOSS OF NORMAL POWER.
3. ALL WIRING MUST BE SUPERVISED.
4. FIRE ALARM PANEL AND ANNUNCIATOR PANEL ARE EXISTING TO REMAIN.
5. MAINTAIN ALL EXISTING ZONES AND INITIATING CIRCUITS IN BUILDING.
6. VERIFY BATTERY POWER REQUIREMENTS ON SITE PRIOR TO TENDER CLOSE. PROVIDE A SEPARATE CLASS B SIGNALING CIRCUIT FOR STROBE DEVICES OR A SYSTEM COMPATIBLE SYNCHRONIZATION DEVICE FOR USE WITH EXISTING HORN CIRCUIT AND STROBE DEVICES.
7. FIRE ALARM SYSTEM TO BE INSTALLED IN CONFORMANCE WITH CAN/ULC-S524-M, "INSTALLATION OF FIRE ALARM SYSTEMS".
8. FIRE ALARM SYSTEM TO BE VERIFIED IN CONFORMANCE WITH CAN/ULC-S537-M, "VERIFICATION OF FIRE ALARM SYSTEMS", TO ENSURE SATISFACTORY OPERATION.
9. FIRE ALARM CONTROL PANEL TO BE PROGRAMMED TO AUTOMATICALLY SILENCE ALARMS AS PER OBC 3.2.4.20.(13).
10. STROBE CIRCUITS FOR SUITES TO BE ADDRESSABLE AND NUMBER OF LOOPS TO BE VERIFIED WITH STROBE LOADING, SHOWN AS A SINGLE LOOP REFER FLOOR FOR CLARITY ONLY. ADDITIONAL BOOSTER PANEL TO DRIVE NEW CIRCUITS WILL BE REQUIRED.



2 FIRE ALARM RISER  
N.T.S.



No	REVISION	DATE
4		
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T	ISSUED FOR PERMIT & TENDER	2024.12.19
2	ISSUED FOR 90% REVIEW	2024.12.12
1	ISSUED FOR 30% REVIEW	2024.12.05

**MIGHTON ENGINEERING**  
493 LANCASTER ST. W. UNIT 204 PH (519) 745-3703  
KITCHENER, ON N2K 1L8 WEB www.mighton.com

PROJECT TITLE:  
**ROW - 84 FREDERICK ST. RENOVATION & RENEWAL**

84 FREDERICK ST.  
KITCHENER, ON

DRAWING TITLE:  
**FIRE ALARM & LIFE SAFETY GROUND FLOOR - RCP**

DRAWN BY: D.Z.	CUSTOMER PROJECT No. -
CHECKED BY: M.J.	MIGHTON PROJECT No. 45061
DATE: DECEMBER 2024	DRAWING No. E10
SCALE: AS NOTED	



**FIRE ALARM & LIFE SAFETY NOTES:**

- CONNECT ALL EMERGENCY FIXTURES TO LINE SIDE OF LOCAL LIGHTING CIRCUIT.
- NEW HORN/STROBE UNIT TO BE INSTALLED IN ALL SLEEPING ROOMS. DEVICE TO BE CONNECTED TO A NEW CLASS A SIGNAL CIRCUIT. UNIT TO BE SOUNDED ON GENERAL ALARM OR UPON ACTIVATION OF IN ROOM SMOKE DETECTOR. REFER TO FIRE ALARM RISER FOR MORE DETAILS.
- EXISTING PULL STATIONS TO BE REPLACED WHERE NEW ELECTROMAGNETIC LOCKS ARE BEING INSTALLED.
- ENSURE ALL EXISTING HEAT DETECTORS ARE CURRENT AND IN GOOD WORKING ORDER. REPLACE ALL OBSOLETE HEAT DETECTORS.
- REPLACE EXISTING HEAT DETECTOR WITH NEW ADDRESSABLE SMOKE DETECTOR. ALL SMOKE DETECTORS TO BE MAPPED TO ROOM NAMES AND DISPLAYED AT THE ANNUNCIATOR AS THEIR ROOM NAME. UPON ACTIVATION OF SMOKE DETECTOR LOCAL ROOM HORN/STROBE TO ACTIVATE. REMOVE EXISTING BATTERY SMOKE ALARM.

**MAGLOCK NOTES:**

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- MANUAL PULL STATION TO BE C/W AUXILIARY CONTACT FOR ELECTROMAGNETIC LOCK. LOCATE THE MANUAL PULL STATION A MINIMUM OF 405mm FROM BARRIER-FREE OBSTRUCTIONS AND A MAXIMUM OF 600mm FROM THE DOOR.
- EXISTING EXITS TO REMAIN.
- COORDINATE EXACT LOCATION OF CARD READERS ON SITE WITH SECURITY INSTALLERS AND OWNERS REPRESENTATIVE PRIOR TO ROUGH-IN.
- CONNECT NEW EXIT SIGNS TO EXISTING EXIT SIGN CIRCUIT.
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- EXISTING EMERGENCY LIGHTING TO REMAIN.
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- PROVIDE ROUGH-IN AND WIRING FOR ALL DOOR ACCESS HARDWARE, CARD READERS, MAGNETIC LOCKING DEVICES AND LOW VOLTAGE TRANSFORMERS (REFER TO ARCHITECTURAL PLANS FOR REQUIREMENTS). CONFIRM FINAL LAYOUT AND WIRING REQUIREMENTS WITH DOOR HARDWARE SHOP DRAWINGS PRIOR TO RELATED WORK.
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  - K.E. FAULT DETECTED BETWEEN FIRE ALARM CONTROL PANEL AND THE LOCKING DEVICE CONTROLLER.
  - K.F. SIGNAL FROM CARD READER.

1 SECOND FLOOR - REFLECTED CEILING PLAN  
1/8"=1'-0"



4		
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T	ISSUED FOR PERMIT & TENDER	2024.12.19
2	ISSUED FOR 90% REVIEW	2024.12.12
1	ISSUED FOR 30% REVIEW	2024.12.05
No	REVISION	DATE

**MIGHTON ENGINEERING**

493 LANCASTER ST. W. UNIT 204 PH (519) 745-3703  
KITCHENER, ON N2K 1L8 WEB www.mighton.com

PROJECT TITLE:  
**ROW - 84 FREDERICK ST.  
RENOVATION & RENEWAL**  
84 FREDERICK ST.  
KITCHENER, ON

DRAWING TITLE:  
**FIRE ALARM & LIFE SAFETY  
SECOND FLOOR - RCP**

DRAWN BY: D.Z.	CUSTOMER PROJECT No. -
CHECKED BY: M.J.	MIGHTON PROJECT No. 45061
DATE: DECEMBER 2024	DRAWING No. E11
SCALE: AS NOTED	



- FIRE ALARM & LIFE SAFETY NOTES:**
- CONNECT ALL EMERGENCY FIXTURES TO LINE SIDE OF LOCAL LIGHTING CIRCUIT..
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  - EXISTING PULL STATIONS TO BE REPLACED WHERE NEW ELECTROMAGNETIC LOCKS ARE BEING INSTALLED.
  - EXISTING EMERGENCY LIGHTING IN THIS ROOM TO BE REMOVED TO SUIT NEW PARTITIONS. REWORK LOW VOLTAGE WIRING TO SUIT TWO NEW DUAL HEADS AS SHOWN.
  - ENSURE ALL EXISTING HEAT DETECTORS ARE CURRENT AND IN GOOD WORKING ORDER. REPLACE ALL OBSOLETE HEAT DETECTORS.
  - MOUNT FIRE ALARM SMOKE DETECTOR AT TOP OF STAIR SHAFT.
  - MOUNT SMOKE DETECTOR AT TOP OF ELEVATOR SHAFT.
  - REPLACE EXISTING HEAT DETECTOR WITH NEW ADDRESSABLE SMOKE DETECTOR. ALL SMOKE DETECTORS TO BE MAPPED TO ROOM NAMES AND DISPLAYED AT THE ANNUNCIATOR AS THEIR ROOM NAME. UPON ACTIVATION OF SMOKE DETECTOR LOCAL ROOM HORN/STROBE TO ACTIVATE. REMOVE EXISTING BATTERY SMOKE ALARM.

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    - K.F. SIGNAL FROM CARD READER.

1 THIRD FLOOR - REFLECTED CEILING PLAN  
1/8"=1'-0"

EMERGENCY LUMINAIRE SCHEDULE						
TYPE	ACCEPTABLE MANUFACTURERS	MODELS	CATALOGUE NUMBERS	DESCRIPTION WATTS/LUMENS	LOCATION MOUNTING HEIGHT	NOTES
EC	LUMACELL	LSC	LSC.1250.W.2.LD7	EXIT COMBO 2-4W LED 120/12V	GENERAL WALL SEE NOTES	MOUNT BETWEEN 7'-6" AND 10'-0" AFF. C/W 30 MINUTE INTERNAL BATTERY
X	LUMACELL	LS	LS.3.W.U	EXIT SIGN LED FACE 120V	GENERAL SEE NOTES	MOUNT BETWEEN 7'-6" AND 10'-0" AFF. C/W 90 MINUTE INTERNAL BATTERY
B3	LUMACELL	CM-SB	CM-SB-L	BATTERY UNIT 2-2W LED 120V	GENERAL SEE NOTES	MOUNT BETWEEN 7'-6" AND 10'-0" AFF. C/W 90 MINUTE INTERNAL BATTERY
E3	LUMACELL	CM-R	CM-R.2-L	EMERGE. REMOTE 2-2W LED 6-12V	GENERAL WALL SEE NOTES	MOUNT BETWEEN 7'-6" AND 10'-0" AFF.
EC.2	LUMACELL	LNC	LNC.1.W.12N60.LD.7	EXT. EXIT COMBO 2-4W LED 120/12V	EXTERIOR WALL SEE NOTES	MOUNT BETWEEN 7'-6" AND 10'-0" AFF. C/W 30 MINUTE INTERNAL BATTERY



4		
3		
T	ISSUED FOR PERMIT & TENDER	2024.12.19
2	ISSUED FOR 90% REVIEW	2024.12.12
1	ISSUED FOR 30% REVIEW	2024.12.05
No	REVISION	DATE



493 LANCASTER ST. W. UNIT 204 PH (519) 745-3703  
KITCHENER, ON N2K 1L8 WEB www.mighton.com

PROJECT TITLE:  
**ROW - 84 FREDERICK ST.  
RENOVATION & RENEWAL**

84 FREDERICK ST.  
KITCHENER, ON

DRAWING TITLE:  
**FIRE ALARM & LIFE SAFETY  
THIRD FLOOR - RCP**

DRAWN BY: D.Z.	CUSTOMER PROJECT No. -
CHECKED BY: M.J.	MIGHTON PROJECT No. 45061
DATE: DECEMBER 2024	DRAWING No. E12
SCALE: AS NOTED	



**84 Frederick Street  
Electrical, Mechanical, And  
Plumbing Report**

# 1.0 Basement

## 1.1 Room B36

by Owner, n.i.c.

**1.1.1 Exhaust Fan 13- Needs to be serviced. (Belts, Bearings, Motor) Refer to Figure 1.1.1**

**1.1.2 Shower Exhaust Fan- Needs new power switch, the louvres are not operating. Refer to Figure 1.1.2**

**1.1.3 Washroom GFI- Not operating. Refer to Figure 1.1.3**



Figure 1.1.1



Figure 1.1.2



Figure 1.1.3

# 1.2 Room B33

1.2.1 Light switch cover plate is broken and needs to be replaced. Refer to Figure 1.2.1



Figure 1.2.1

# 1.3 Room N6

1.3.1 Receptacle #1 is loose and needs to be serviced. Refer to Figure 1.3.1

1.3.2 Receptacle #5 (Next to kitchen sink) is pushed into the electrical box and needs to be serviced. Refer to Figure 1.3.2

1.3.3 Heating rad in the room has a rusted cover. Refer to Figure 1.3.3



Figure 1.3.1

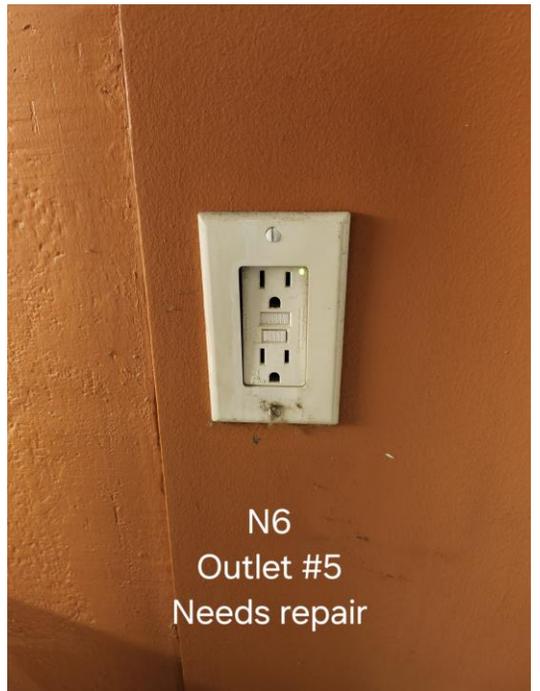


Figure 1.3.2



Figure 1.3.3

# 1.4 Shower

by Owner, n.i.c.

**1.4.1 Exhaust Fan is very noisy and needs to be serviced. Refer to Figure 1.4.1**

**1.4.2 Receptacle located in the shower area is not a GFI and needs to be replaced or removed. Refer to Figure 1.4.2**

**1.4.3 Shower head has a slow drip even when shower is off. Shower valve needs to be serviced. Refer to Figure 1.4.3**



**Figure 1.4.1**



**Figure 1.4.2**



**Figure 1.4.3**

# 1.5 Room B27

by Owner, n.i.c.

**1.5.1 Back Flow Preventer needs to be tested. Refer to Figure 1.5.1**

**1.5.2 Water Softener is old and should be serviced/replaced. Refer to Figure 1.5.2**

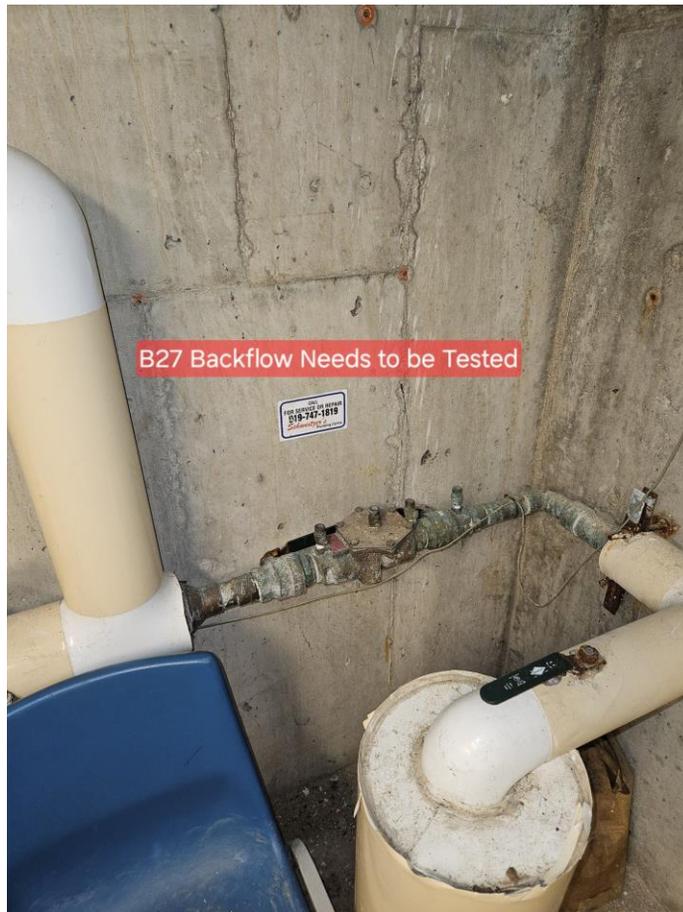


Figure 1.5.1



Figure  
1.5.2

# 1.6 Quiet Room

1.6.1 Heating rad is missing the cover. Rad is in good shape otherwise. Refer to Figure 1.6.1



Figure 1.6.1

# 1.7 Hallway

In Contract. Refer also to Architectural Floor Plans and Details

1.7.1 In the hallway outside of the Quiet Room and B27, there is water damage on the ceiling and walls. Refer to Figure 1.7.1 - 1.7.3



Figure 1.7.1

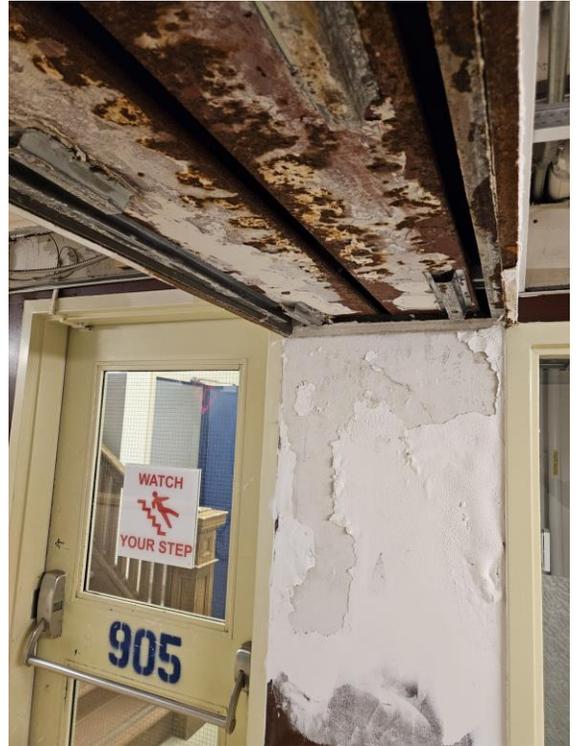


Figure 1.7.2

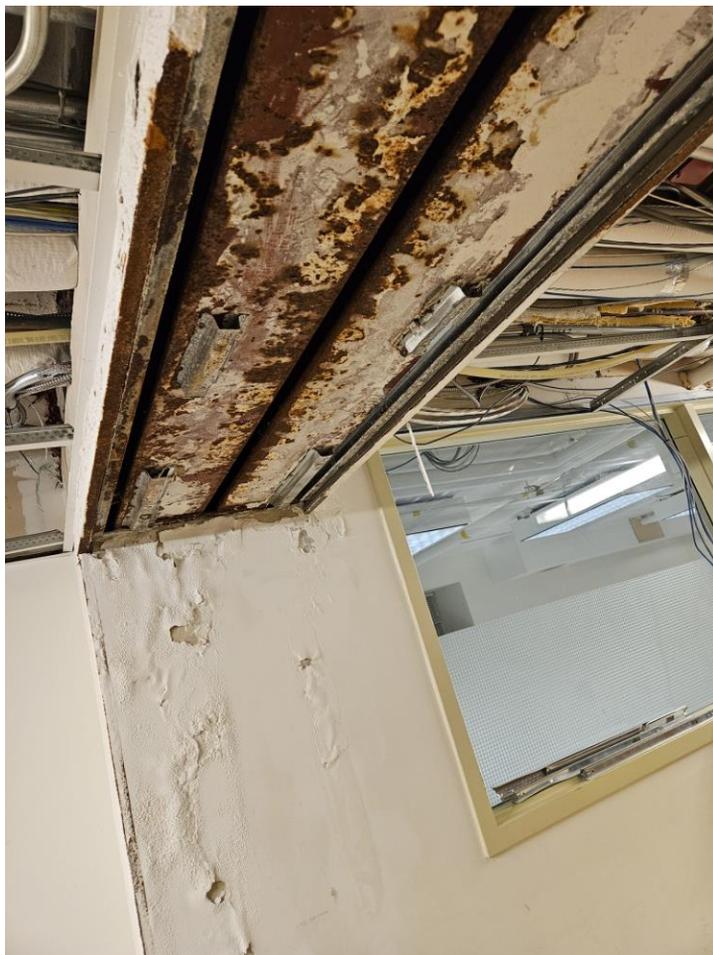
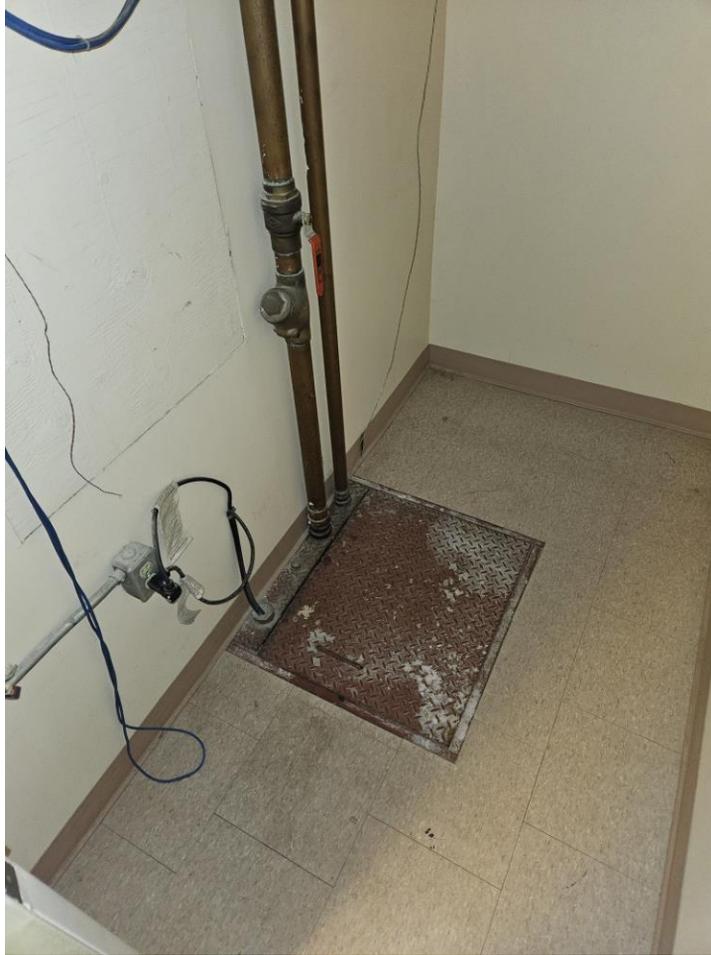


Figure 1.7.3

# 1.8 Room B4 (Behind Elevator)

by Owner, n.i.c.

**1.8.1** The sump pump is operational but should be serviced to avoid any failures. **Refer to Figure 1.8.1**

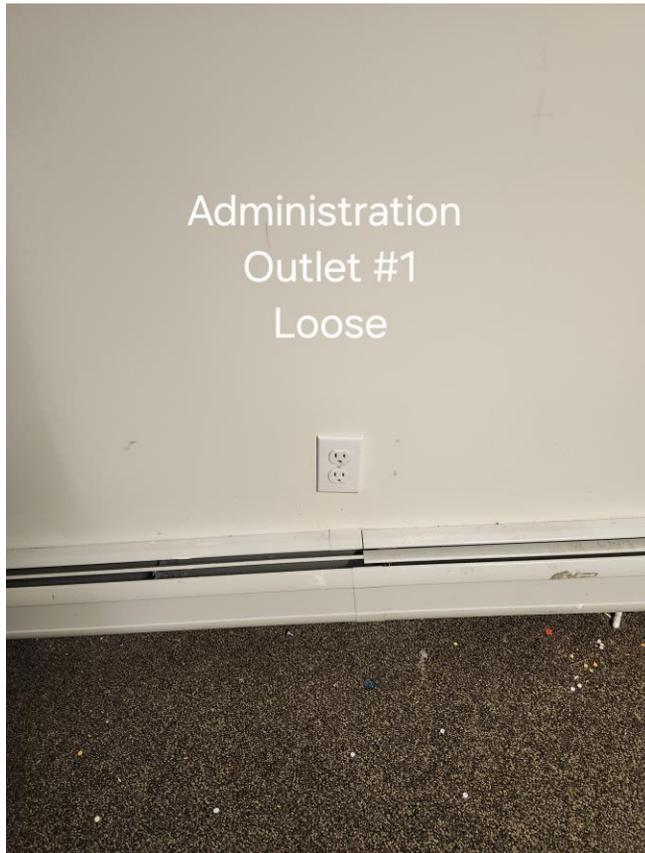


**Figure 1.8.1**

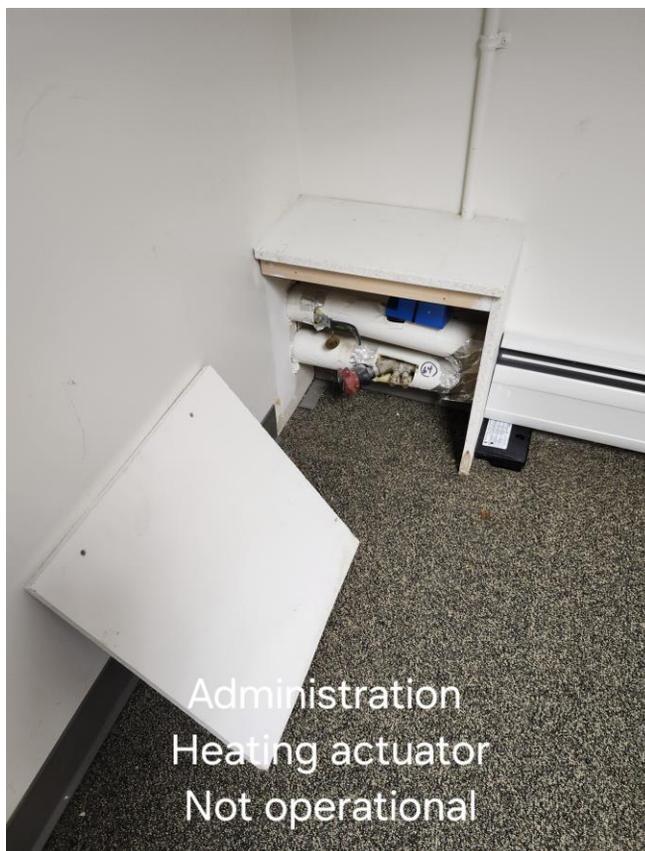
# 1.9 Room B25

**1.9.1** Receptacle #1 is loose and needs to be serviced. Refer to Figure 1.9.1

**1.9.2** The heating actuator needs to be replaced. Has a loud noise when opening and doesn't always open properly. Refer to Figure 1.9.2



**Figure 1.9.1**



**Figure 1.9.2**

# 1.10 Room B23

1.10.1 Receptacle #2 is loose and needs to be serviced. Refer to Figure 1.10.1



# 1.11 Room B19

by Owner, n.i.c.

**1.11.1 Grease trap needs to be inspected and potentially cleaned. Refer to Figure 1.11.1**



**Figure 1.11.1**

# 1.12 Room B16

**1.12.1** Toilet in the left stall is loose and needs to be tightened/shimmed. Refer to Figure 1.12.1

**1.12.2** Toilet in the right stall has a cracked tank lid. Refer to Figure 1.12.2

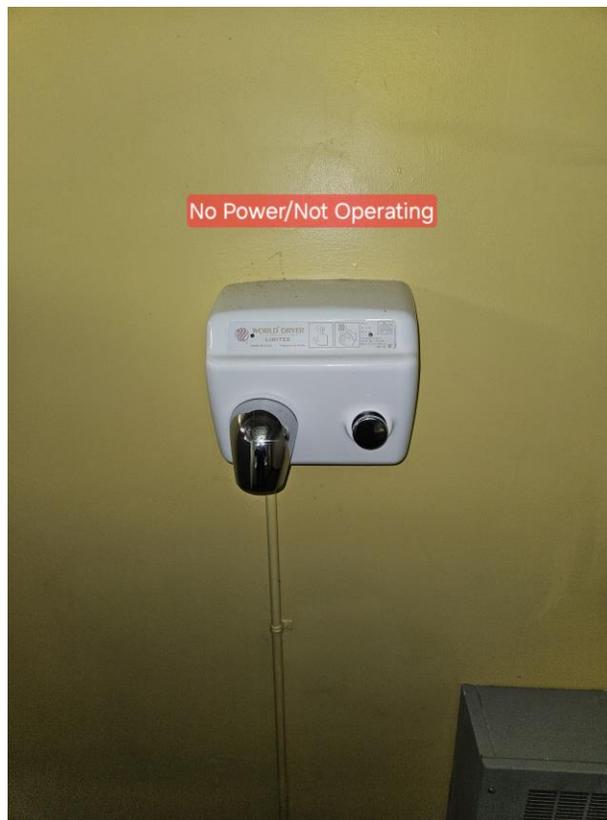
**1.12.3** Hand dryer does not have any power. Refer to Figure 1.12.3



**Figure 1.12.1**



**Figure 1.12.2**



**Figure 1.12.3**

# 1.13 Room B15

**1.13.1** Toilet is loose and is always running. It is recommended this toilet be replaced given the age and condition. Refer to Figure 1.13.1



**Figure 1.13.1**

# 1.14 Room B14

**1.14.1** Receptacle box is not secured to the wall properly. Needs to be secured. **Refer to Figure 1.14.1**



**Figure 1.14.1**

# 1.15 Room B13

**1.15.1** Toilet needs a flush handle but given the age and condition, replacement is recommended. **Refer to Figure 1.15.1**

**1.15.2** Slow drip coming from the faucet. **Refer to Figure 1.15.2**

**1.15.3** Hand dryer does not have any power. **Refer to Figure 1.15.3**



**Figure 1.15.1**



**Figure 1.15.2**

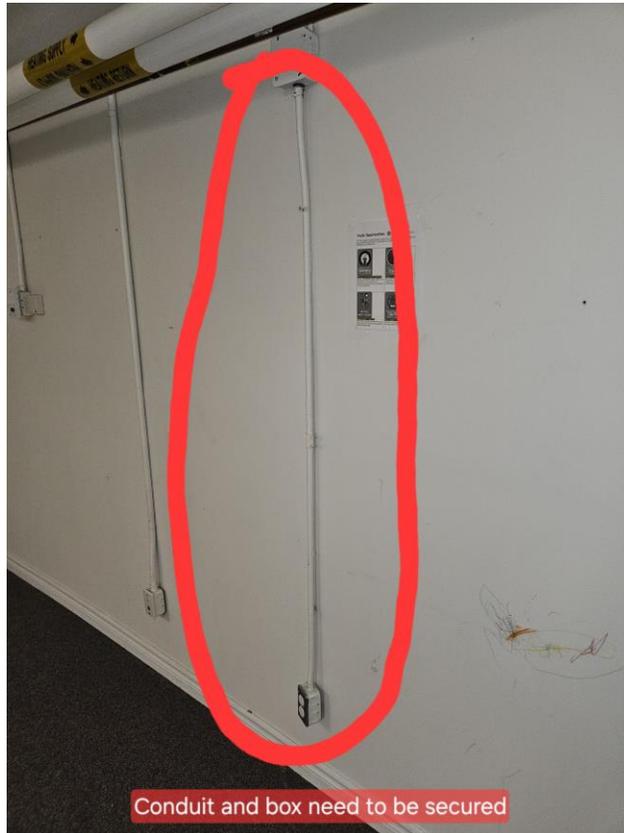


**Figure 1.15.3**

# 1.16 Room B12

**1.16.1** Receptacle #2 is loose and needs to be fastened properly. Refer to Figure 1.16.1

**1.16.2** Heating rad needs the cover put back on, fins look okay. Refer To Figure 1.16.2



**Figure 1.16.1**



**Figure 1.16.2**

# 1.17 Room B09

1.17.1 Receptacle #2 is loose and needs to be fastened properly. Refer to Figure 1.17.1

~~1.17.2 One of the lights in the room is out and needs service. Refer to Figure 1.17.2~~

1.17.3 The heating rad needs the cover reinstalled. Refer to Figure 1.17.3



Figure 1.17.1



Figure 1.17.2



Figure 1.17.3

# 1.18 Room B07

**1.18.1** Receptacle #4 does not have any power. Refer to Figure 1.18.1

**1.18.2** Receptacle #7 does not have any power and is not installed properly. Refer to Figure 1.18.2

**1.18.3** Heating rad needs the cover reinstalled. Refer to Figure 1.18.3

**1.18.4** Excessive water damage in front of the window. Refer to Figure 1.18.4



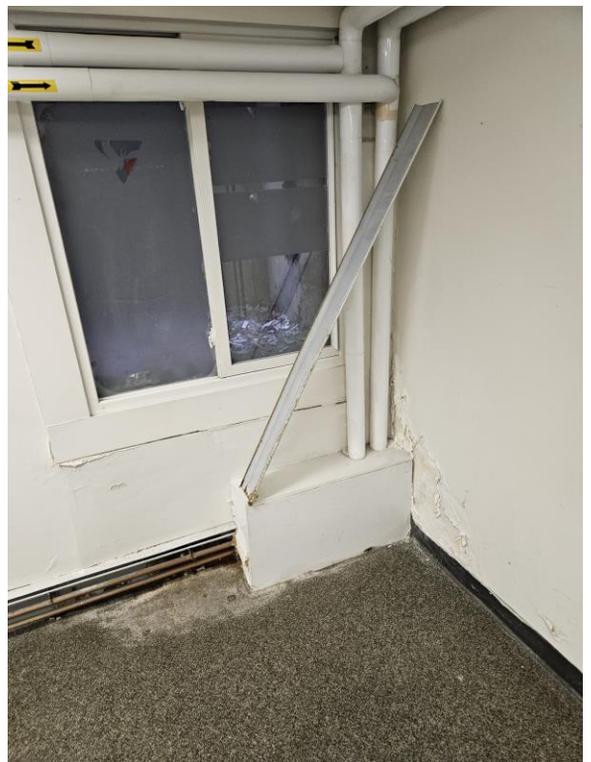
**Figure 1.18.1**



**Figure 1.18.2**



**Figure 1.18.3**



**Figure 1.18.4**

# 1.19 Room B05A

~~1.19.1 One of the lights is out and requires service. Refer to Figure 1.19.1~~

1.19.2 Heating rad needs the cover reinstalled. Refer to Figure 1.19.2



Figure 1.19.1



Figure 1.19.2

# 1.20 Room B03

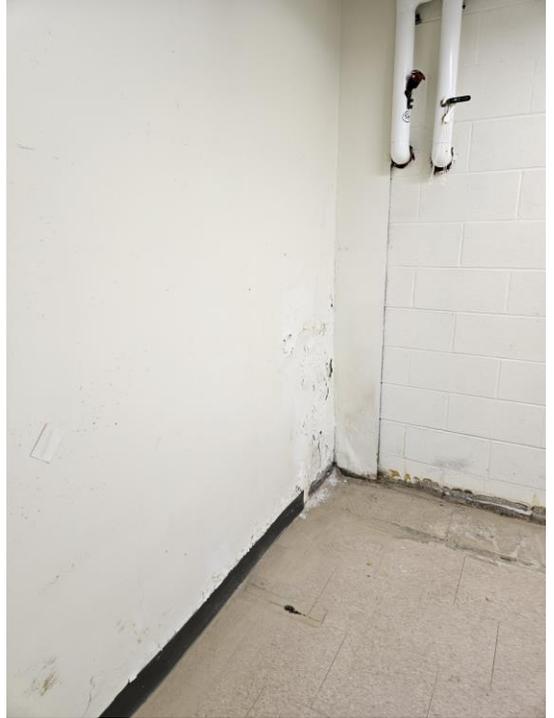
**1.20.1** Receptacle #4 does not have any power. Refer to Figure 1.20.1

**1.20.2** The left corner of the room has water damage. Refer to Figure 1.20.2

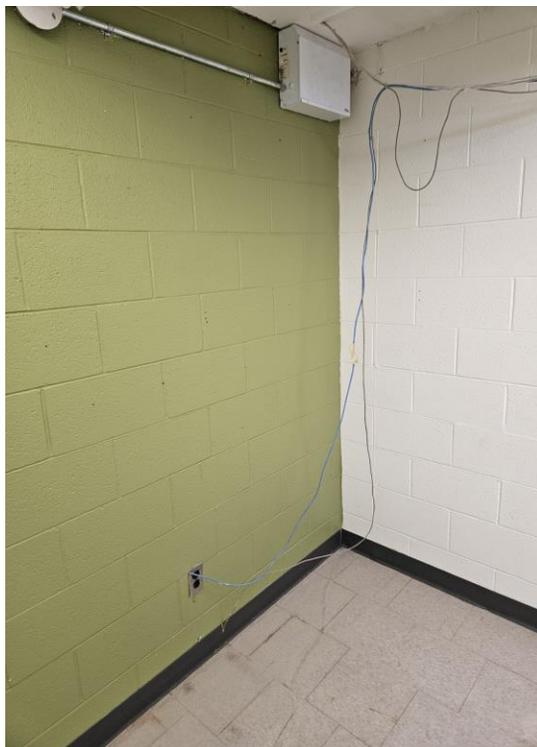
**1.20.3** There is an ethernet/control cable going through receptacle #1 and another cable going through the wall. The wires are just hanging free and should be routed better to avoid any damage to the cables. Refer to Figure 1.20.3



**Figure 1.20.1**



**Figure 1.20.2**



**Figure 1.20.3**

# 1.21 Room N3

**1.21.1** The kitchen faucet is defective and should be replaced. Refer to Figure 1.21.1

**1.21.2** The shower valve in the washroom is leaking and should be replaced. Refer to Figure 1.21.2

**1.21.3** The tub drain should be replaced due to corrosion. Refer to Figure 1.21.3

**1.21.4** Toilet internals are in rough shape and should be replaced. Refer to Figure 1.21.4

**1.21.5** Heating rads need their covers reinstalled. Refer to Figure 1.21.5 and 1.21.6



**Figure 1.21.1**



**Figure 1.21.2**



**Figure 1.21.3**



**Figure 1.21.4**

# 1.21 Room N3 Continued



Figure 1.21.5



Figure 1.21.6

# 1.22 Room N4

**1.22.1** Toilet needs to be replaced. Refer to Figure 1.22.1

**1.22.2** Tub drain should be replaced due to corrosion. Refer to Figure 1.22.2

**1.22.3** The overflow for the tub is missing and should be reinstated. Refer to Figure 1.22.2

**1.22.4** Tub spout, shower valve, and shower head should be replaced. Refer to Figure 1.22.3

**1.22.5** Kitchen faucet needs to be replaced. Refer to Figure 1.22.4

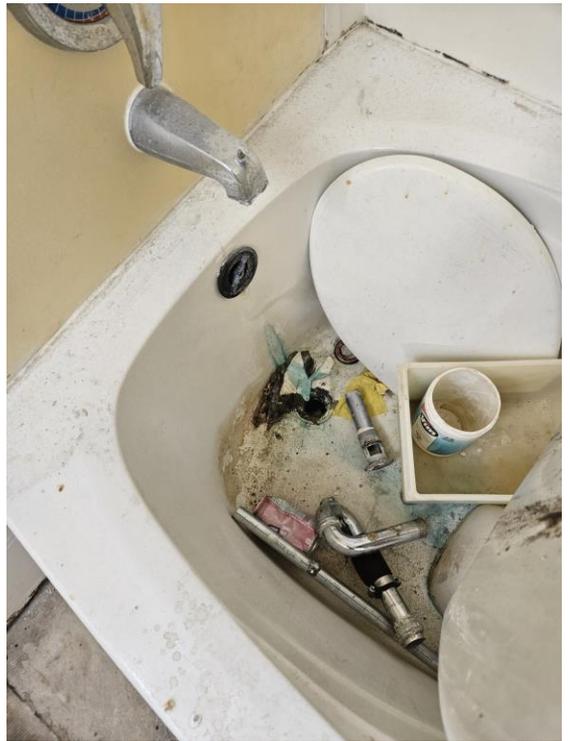
**1.22.6** Heating rads should be replaced, each rad is 6ft long. Refer to Figure 1.22.5, 1.22.6

**1.22.7** Space has mold in certain areas. Refer to Figure 1.22.7, 1.22.8, 1.22.9

**1.22.8** Receptacle next to the kitchen sink needs to be installed properly. Refer to Figure 1.22.10



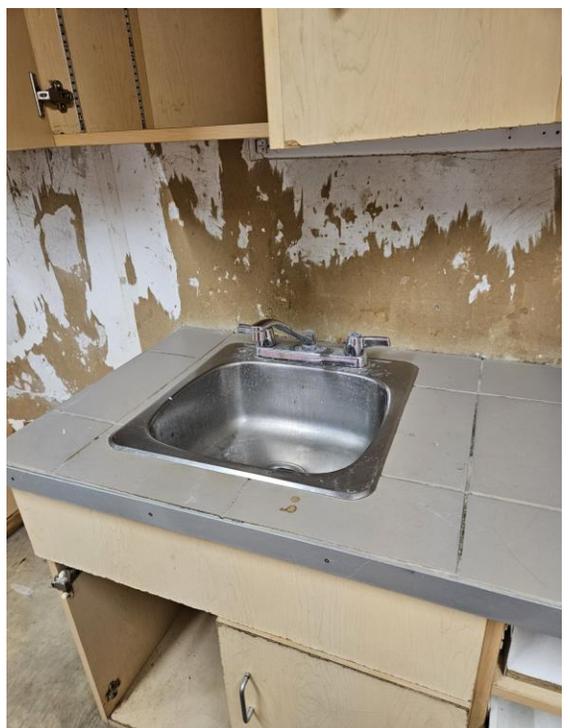
**Figure 1.22.1**



**Figure 1.22.2**



**Figure 1.22.3**



**Figure 1.22.4**

# 1.22 Room N4 Continued



Figure 1.22.5



Figure 1.22.6



Figure 1.22.7



Figure 1.22.8

# 1.22 Room N4 Continued



Figure 1.22.9



Figure 1.22.10



Figure 1.22.11

# 1.23 Room B01

**1.23.1** There is mold in certain parts of the room from past water leaks. Refer to **Figure 1.23.1** and **1.23.2**

**1.23.2** Receptacle #2 needs to be installed properly as it is just sticking out of the wall. Refer to **Figure 1.23.3**

**1.23.3** Heating rad covers need to be reinstalled, the fins are in good condition. Refer to **Figure 1.23.4**

**1.23.4** The ceiling will have to be patched. Refer to **Figure 1.23.5** and **1.23.6**



**Figure 1.23.1**



**Figure 1.23.2**



**Figure 1.23.3**



**Figure 1.23.4**

## 1.23 Room B01 Continued



Figure 1.23.5



Figure 1.23.6

# 2.0 Main Floor

## 2.1 Room "ESW"

Reception (Room no.125b)

2.1.1 All receptacles are either loose or broken. These will need to be secured properly or replaced. Refer to Figure 2.1.1 and 2.1.2



Figure 2.1.1



Figure 2.1.2

## 2.2 Room "Interview"

Intake Office (Room no. 125a)

2.2.1 Outlet #1 in the interview room is loose and needs to be secured. Refer to Figure 2.2.1



Figure 2.2.1

## 2.3 Room "WC"

2.3.1 Toilet needs the proper seat as it should a round one and not elongated. Refer to Figure 2.3.1

2.3.2 Toilet is always running water, it requires a new flapper valve as well as a flush valve. Refer to Figure 2.3.2

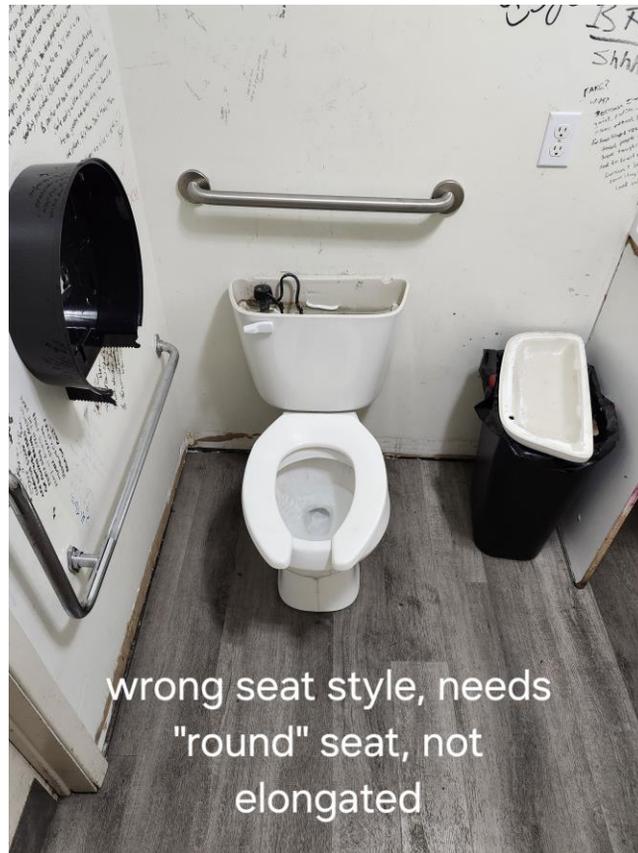


Figure 2.3.1



Figure 2.3.2

## 2.4 Lounge

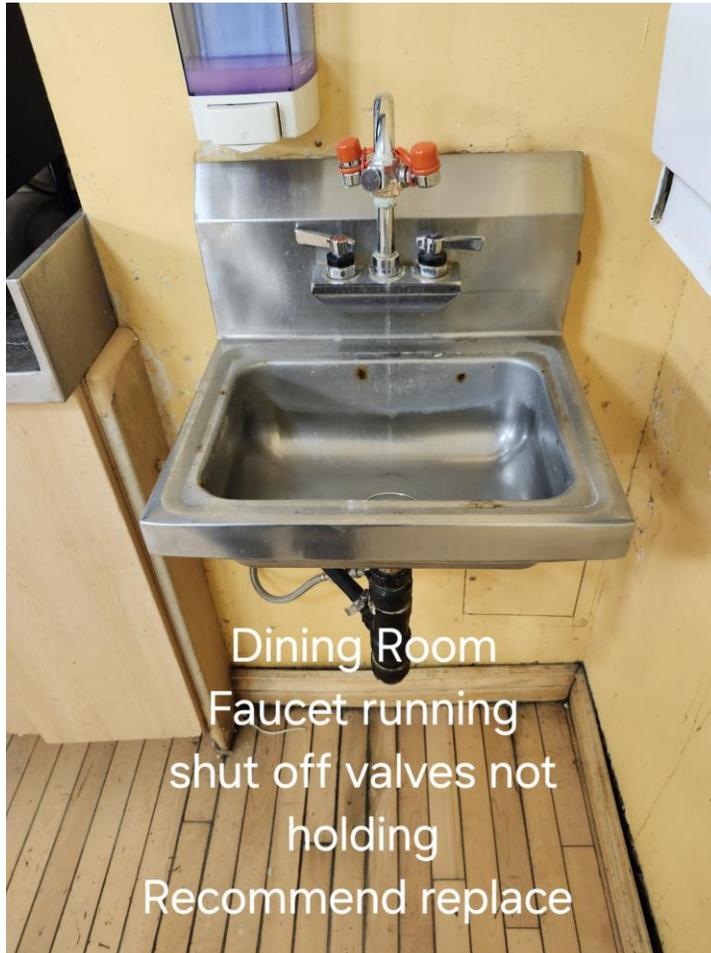
2.4.1 Receptacle #1 is defective and should be replaced. Refer to Figure 2.4.1



Figure 2.4.1

## 2.5 Dining Room

**2.5.1** Faucet has a slow drip coming from it indicating the shut offs are leaking by. It is recommended the tap be replaced. **Refer to Figure 2.5.1**



**Figure 2.5.1**

## 2.6 Serve

**2.6.1** Receptacle #1 is loose and should be secured properly. Refer to Figure 2.6.1

**2.6.2** Receptacle #2 has a broken cover. This cover should be replaced. Refer to Figure 2.6.2

**2.6.3** The faucet for the sink is loose and will need to be secured. Refer to Figure 2.6.3



**Figure 2.6.1**



**Figure 2.6.2**



**Figure 2.6.3**

# 2.7 Kitchen

2.7.1 Hand sink has valves are not holding and are allowing a slow drip. It is recommended the tap be replaced. Refer to Figure 2.7.1

2.7.2 The main sink has a leak coming out of the faucet. It is recommended the tap be replaced. Refer to Figure 2.7.2



Figure 2.7.1



Figure 2.7.2

## 2.8 Lunchroom

Food Storage (Room no.108)

2.8.1 Receptacle #2 is broken and should be replaced. Refer to Figure 2.8.1

2.8.2 Floor is spongy from water damage. Refer to Figure 2.8.2



Figure 2.8.1



Figure 2.8.2

## 2.9 Room "S1"

**2.9.1** Receptacle #1 needs a cover installed. Refer to Figure 2.9.1

**2.9.2** Receptacle #2 needs a cover installed. Refer to Figure 2.9.2



**Figure 2.9.1**



**Figure 2.9.2**

## 2.10 Dry Storage

2.10.1 Old refrigerant lines should be capped or removed. Refer to Figure 2.10.1



Figure 2.10.1

# 2.11 Room "N1"

**2.11.1** Toilet is loose and needs to be tightened/shimmed. Refer to Figure 2.11.1

**2.11.2** Washroom light is out. Refer to Figure 2.11.2

**2.11.3** Range hood fan has no power. Should be checked for proper operation. Refer to Figure 2.11.3

**2.11.4** Receptacle #4 needs a new cover installed. Refer to Figure 2.11.4

**2.11.5** Space has signs of past water damage on the ceiling. Refer to Figure 2.11.5



**Figure 2.11.1**



**Figure 2.11.2**



**Figure 2.11.3**



**Figure 2.11.4**

## 2.11 Room "N1" Continued



Figure 2.11.5

## 2.12 Room "N2"

**2.12.1** Kitchen faucet is loose and needs to be secured. Refer to Figure 2.12.1

**2.12.2** Washroom receptacle needs a new cover installed. Refer to Figure 2.12.2

**2.12.3** Tub spout is defective and should be replaced. Refer to Figure 2.12.3

**2.12.4** Heating rad cover needs to be installed properly. Refer to Figure 2.12.4

**2.12.5** Light is out in the washroom. Refer to Figure 2.12.5



**Figure 2.12.1**



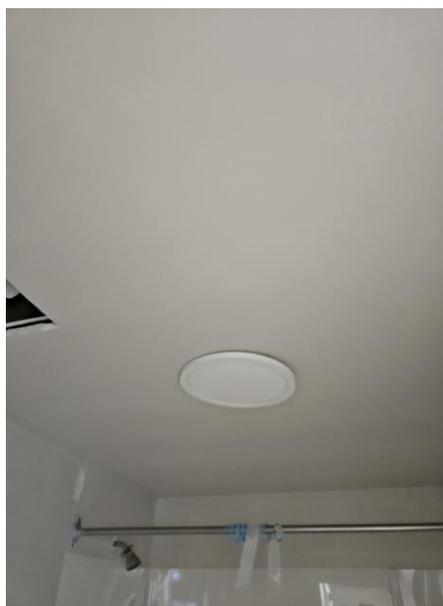
**Figure 2.12.2**



**Figure 2.12.3**



**Figure 2.12.4**



**Figure 2.12.5**

# 3.0 Second Floor

## 3.1 Room 201

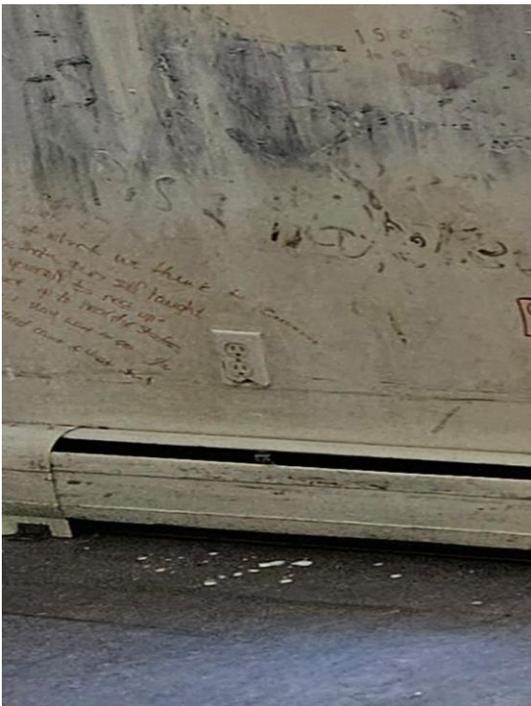
**3.1.1** Receptacles #2 and #3 need covers installed. Refer to Figures 3.1.1 and 3.1.2

**3.1.2** Heating rad needs to be replaced due to the damage done to it. The rad is 14 ft long. Refer to Figure 3.1.3

**3.1.3** The thermostat in the space is defective and needs to be replaced. Refer to Figure 3.1.4

**3.1.4** The bathroom toilet shut off valve should be replaced due to its age and condition. Refer to Figure 3.1.5

**3.1.5** The bathroom GFI is defective and needs to be replaced. Refer to Figure 3.1.6



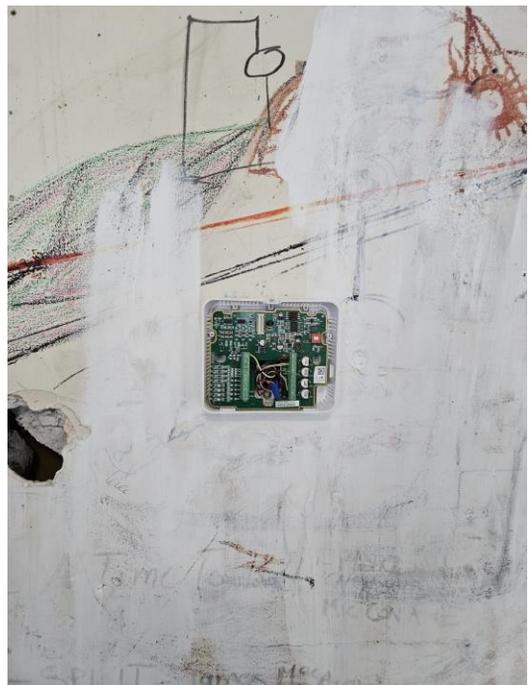
**Figure 3.1.1**



**Figure 3.1.2**



**Figure 3.1.3**



**Figure 3.1.4**

## 3.1 Room 201 Continued



Figure 3.1.5



Figure 3.1.6

## 3.2 Room 202

**3.2.1** The shower head in the bathroom is missing. Refer to Figure 3.2.1

**3.2.2** The toilet has a crack on the bowl and is in rough shape, it is recommended that it be replaced. Refer to Figure 3.2.2

**3.2.3** The heating rad is in rough shape and should be replaced. The rad is 14ft long. Refer to Figure 3.2.3



Figure 3.2.1



Figure 3.2.2



Figure 3.2.3

## 3.3 Room 205

**3.3.1** Receptacle #2 is loose and should be secured. Refer to Figure 3.3.1

**3.3.2** Receptacle #3 needs a new cover installed. Refer to Figure 3.3.2

**3.3.3** GFI located in the bathroom is defective and needs to be replaced. Refer to Figure 3.3.3

**3.3.4** The drain in the bathroom sink is plugged and should be cleaned out. Refer to Figure 3.3.4

**3.3.5** The heating rad should be replaced due to the damage done to it. Refer to Figure 3.3.5



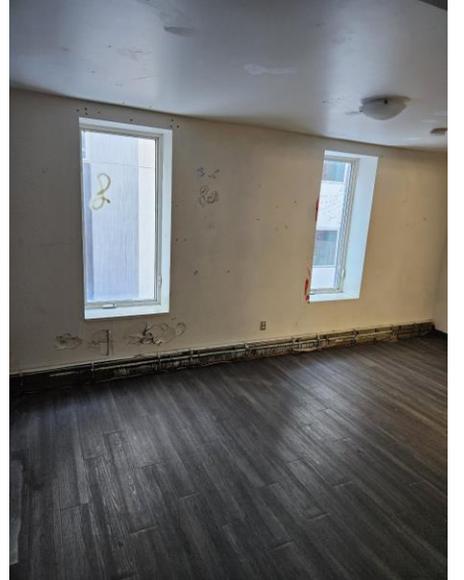
**Figure 3.3.1**



**Figure 3.3.2**



**Figure 3.3.3**



**Figure 3.3.4**



**Figure 3.3.5**

# 3.4 Room 206

**3.4.1** Receptacle #1 is loose and needs to be secured properly.

**3.4.2** Receptacles #2 and #3 need new covers installed. **Refer to Figures 3.4.2 and 3.4.3**

**3.4.3** Due to the damage to the heating rad, it should be replaced. The rad is 14ft long. **Refer to Figure 3.4.4**

**3.4.4** Sink drain in the bathroom is plugged and should be cleaned out. **Refer to Figure 3.4.5**

**3.4.5** The light switch located right when you walk in the room is damaged and should be replaced. **Refer to Figure 3.4.6**

**3.4.6** The water shutoff for the toilet should be changed due to the rough shape as well as the age. **Refer to Figure 3.4.7**



**Figure 3.4.2**



**Figure 3.4.3**



**Figure 3.4.4**



**Figure 3.4.5**



**Figure 3.4.6**



**Figure 3.4.7**

# 3.5 Room 211

**3.5.1** The heating rad has been damaged and should be replaced. The rad is 14ft in length. Refer to Figure 3.5.1

**3.5.2** Receptacle #2 needs a new cover installed. Refer to Figure 3.5.2

**3.5.3** The space thermostat is defective and needs to be replaced. Refer to Figure 3.5.3

**3.5.4** The toilet is constantly running, requires new tank internals. Refer to Figure 3.5.4

**3.5.5** The shower head is defective and requires a new one. Refer to Figure 3.5.5



**Figure 3.5.1**



**Figure 3.5.2**



**Figure 3.5.3**



**Figure 3.5.4**



**Figure 3.5.5**

## 3.6 Room 212

**3.6.1** The heating rad is damaged and should be replaced. The rad is 14ft long. **Refer to Figure 3.6.1**

**3.6.2** Receptacles #2 and #3 need covers installed. **Refer to Figure 3.6.2 and 3.6.3**

**3.6.3** Toilet is constantly running, needs new tank internals. **Refer to Figure 3.6.4**



**Figure 3.6.1**



**Figure 3.6.2**



**Figure 3.6.3**



**Figure 3.6.4**

## 3.7 Room 220

**3.7.1** The faucet does not have proper flow, recommend replacement of the tap. **Refer to Figure 3.7.1**

**3.7.2** The receptacle in the room requires a new cover. **Refer to Figure 3.7.2**



**Figure 3.7.1**



**Figure 3.7.2**

# 3.8 Room 221

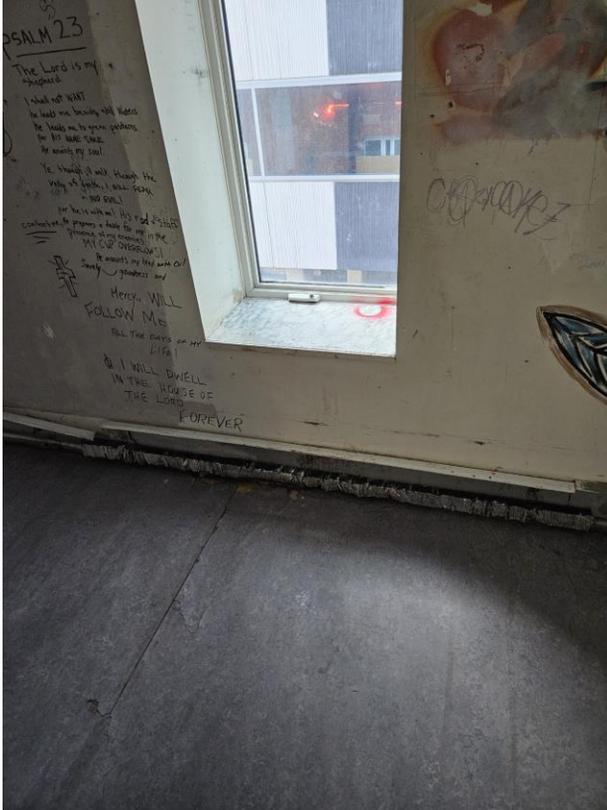
**3.8.1** The heating rad is damaged and should be replaced. The rad is 14ft long. **Refer to Figure 3.8.1**

**3.8.2** Receptacle #2 is defective and should be replaced. **Refer to Figure 3.8.2**

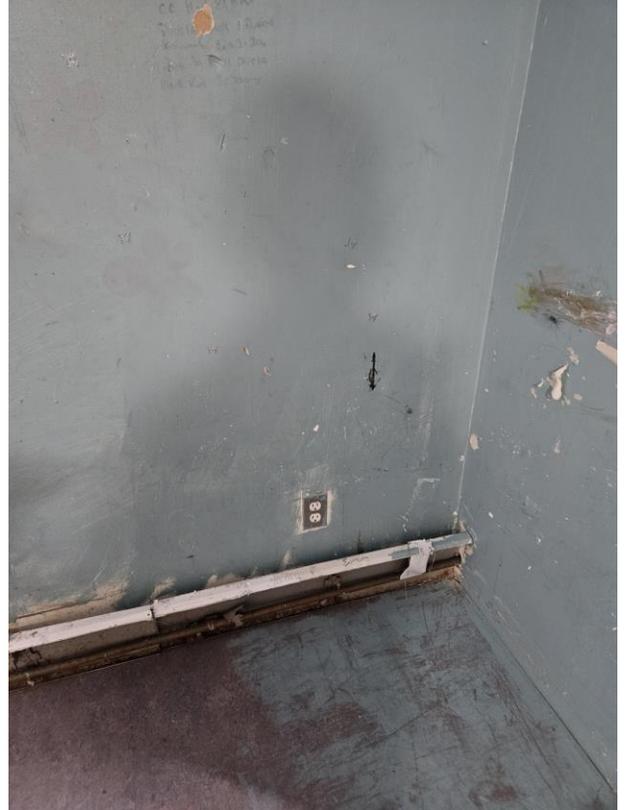
**3.8.3** The tub spout is defective and should be replaced. **Refer to Figure 3.8.3**

**3.8.4** Receptacle #3 is loose and should be secured. **Refer to Figure 3.8.4**

**3.8.5** The toilet seat is vandalized. **Refer to Figure 3.8.5**



**Figure 3.8.1**



**Figure 3.8.2**



**Figure 3.8.3**



**Figure 3.8.4**

## 3.8 Room 221 Continued



Figure 3.8.5

## 3.9 Room 223

**3.9.1** Receptacle #2 is defective and needs to be replaced. **Refer to Figure 3.9.1**

**3.9.2** The heating rad is in rough condition and should be replaced. The rad is 10ft long. **Refer to Figure 3.9.2**

**3.9.3** The thermostat is defective and needs to be replaced. **Refer to Figure 3.9.3**

**3.9.4** The toilet is constantly running and needs a new shut off valve and tank internals. **Refer to Figure 3.9.4**



**Figure 3.9.1**



**Figure 3.9.2**



**Figure 3.9.3**



**Figure 3.9.4**

## 3.10 Room 225

**3.10.1** The GFI requires a new cover to be installed. Refer to Figure 3.10.1

**3.10.2** The shower head is missing and requires a new one. Refer to Figure 3.10.2

**3.10.3** Receptacles #2, #3, and #4 require new covers. Refer to Figure 3.10.3

**3.10.4** The thermostat is defective and needs to be replaced. Refer to Figure 3.10.4

**3.10.5** The bathtub has been vandalized. Needs to be cleaned/replaced. Refer to Figure 3.10.5



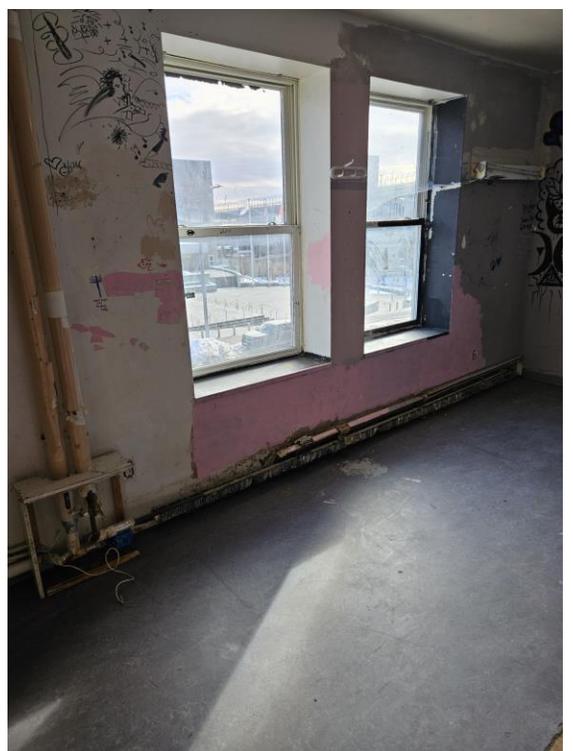
**Figure 3.10.1**



**Figure 3.10.2**



**Figure 3.10.3**



**Figure 3.10.4**

## 3.10 Room 225 Continued



Figure 3.10.5

## 3.11 Room 228

3.11.1 The heating rad is damaged and should be replaced. Refer to Figure 3.11.1



Figure 3.11.1

## 3.12 Room 230

3.12.1 The heating rad is damaged and should be replaced. Refer to Figure 3.12.1



Figure 3.12.1

## 3.13 Room 231

**3.13.1** There is a water leak in the hallway in front of the room. Refer to Figure 3.13.1

**3.13.2** The heating rad is defective and should be replaced. The heater is 6ft long. Refer to Figure 3.13.2

**3.13.3** Receptacle #1 is defective and should be replaced. Refer to Figure 3.13.3

**3.13.4** The toilet is always running and should be replaced. Refer to Figure 3.13.4



**Figure 3.13.1**



**Figure 3.13.2**



**Figure 3.13.3**



**Figure 3.13.4**

## 3.14 Room 233

**3.14.1** The receptacle is loose and should be re-fastened. Refer to figure 3.14.1

**3.14.2** The baseboard heater is defective. Unit is 12ft long. Recommend replacing with new unit. Refer to figure 3.14.2



**Figure 3.14.1**



**Figure 3.14.2**

## 3.15 Room 235

**3.15.1** Toilet lid is broken. Recommend replacing with new toilet. **Refer to figure 3.15.1**

**3.15.2** Baseboard heater is defective. Unit is 12ft long. Recommend replacing with new unit. **Refer to figure 3.15.2**



**Figure 3.15.1**



**Figure 3.15.2**

## 3.16 Room 237

3.16.1 Receptacle is loose. Recommend re-fastening. Refer to figure 3.16.1



Figure 3.16.1

# 4.0 Third Floor

## 4.1 Room 301

**4.1.1** Toilet is broken. Recommend replacing with new. **Refer to figure 4.1.1**

**4.1.2** Baseboard heater is defective. Unit is 14ft long. Recommend replacing with new unit. **Refer to figure 4.1.2**

**4.1.3** Outlet 1 is loose. Recommend re-fastening. **Refer to figure 4.1.3**

**4.1.4** Outlet 3 cover is broken. Recommend installing new outlet cover. **Refer to figure 4.1.4**



**Figure 4.1.1**



**Figure 4.1.2**



**Figure 4.1.3**



**Figure 4.1.4**

## 4.2 Room 302

4.2.1 Toilet is missing from bathroom. Recommend installing new. Refer to figure 4.2.1

4.2.2 Outlets 1 and 2 are defective. Recommend replacing with new receptacles. Refer to figures 4.2.2 and 4.2.3



Figure 4.2.1



Figure 4.2.2



Figure 4.2.3

## 4.3 Lounge

**4.3.1** Outlet #2 is defective. Recommend replacing with new GFI receptacle. **Refer to figure 4.3.1**

**4.3.2** Outlet #3 is loose. Recommend re-fastening. **Refer to figure 4.3.2**



**Figure 4.3.1**



**Figure 4.3.2**

## 4.4 Room 308

4.4.1 Faucet for mop sink is leaking. Recommend replacing with new faucet. **Refer to figure 4.1.1**



Figure 4.4.1

## 4.5 Room 312

**4.5.1** Baseboard heater is defective. Unit is 14ft long. Recommend replacing with new unit.  
**Refer to figure 4.5.1**



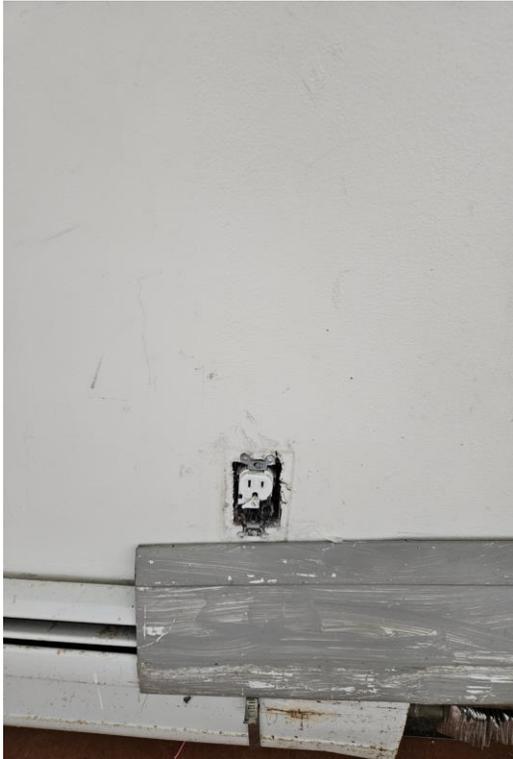
**Figure 4.5.1**

## 4.6 Room 311

**4.6.1** Outlet #2 is broken. Recommend replacing with new receptacle. **Refer to figure 4.6.1**

**4.6.2** Baseboard heater is defective. Unit is 10ft long. Recommend replacing with new unit. **Refer to figure 4.6.2**

**4.6.3** Toilet is broken. Recommend replacing with new fixture. **Refer to figure 4.6.3**



**Figure 4.6.1**



**Figure 4.6.2**



**Figure 4.6.3**

## 4.7 Room 315

4.7.1 Outlet #1 is broken. Recommend replacing with new receptacle. **Refer to figure 4.7.1**

4.7.2 Baseboard heater is defective. Unit is 14ft long. Recommend replacing with new unit. **Refer to figure 4.7.2**



**Figure 4.7.1**



**Figure 4.7.2**

## 4.8 Room 320

**4.8.1** Baseboard heater is defective. Unit is 6ft long. Recommend replacing with new unit. **Refer to figure 4.8.1**



**Figure 4.8.1**

## 4.9 Kitchen

**4.9.1** Outlet #1 is loose. Recommend re-fastening. Refer to figure 4.9.1



**Figure 4.9.1**

# 4.10 Room 322

4.10.1 Faucet damaged. Recommend replacing with new fixture. Refer to figure 4.10.1



Figure 4.10.1

## 4.11 Room 335

**4.11.1** Right side toilet continuously running. Recommend service by plumber and **potential** replacement of fixture. **Refer to 4.11.1**



**Figure 4.11.1**

## 4.12 Room 326

**4.12.1** Outlet #1 is loose. Recommend re-fastening. Refer to figure 4.12.1

**4.12.2** Light fixture is broken. Recommend installing new fixture. Refer to figure 4.12.2



**Figure 4.12.1**



**Figure 4.12.2**

## 4.13 Room 331

4.13.1 Outlet #1 is loose. Recommend re-fastening. Refer to figure 4.13.1



Figure 4.13.1

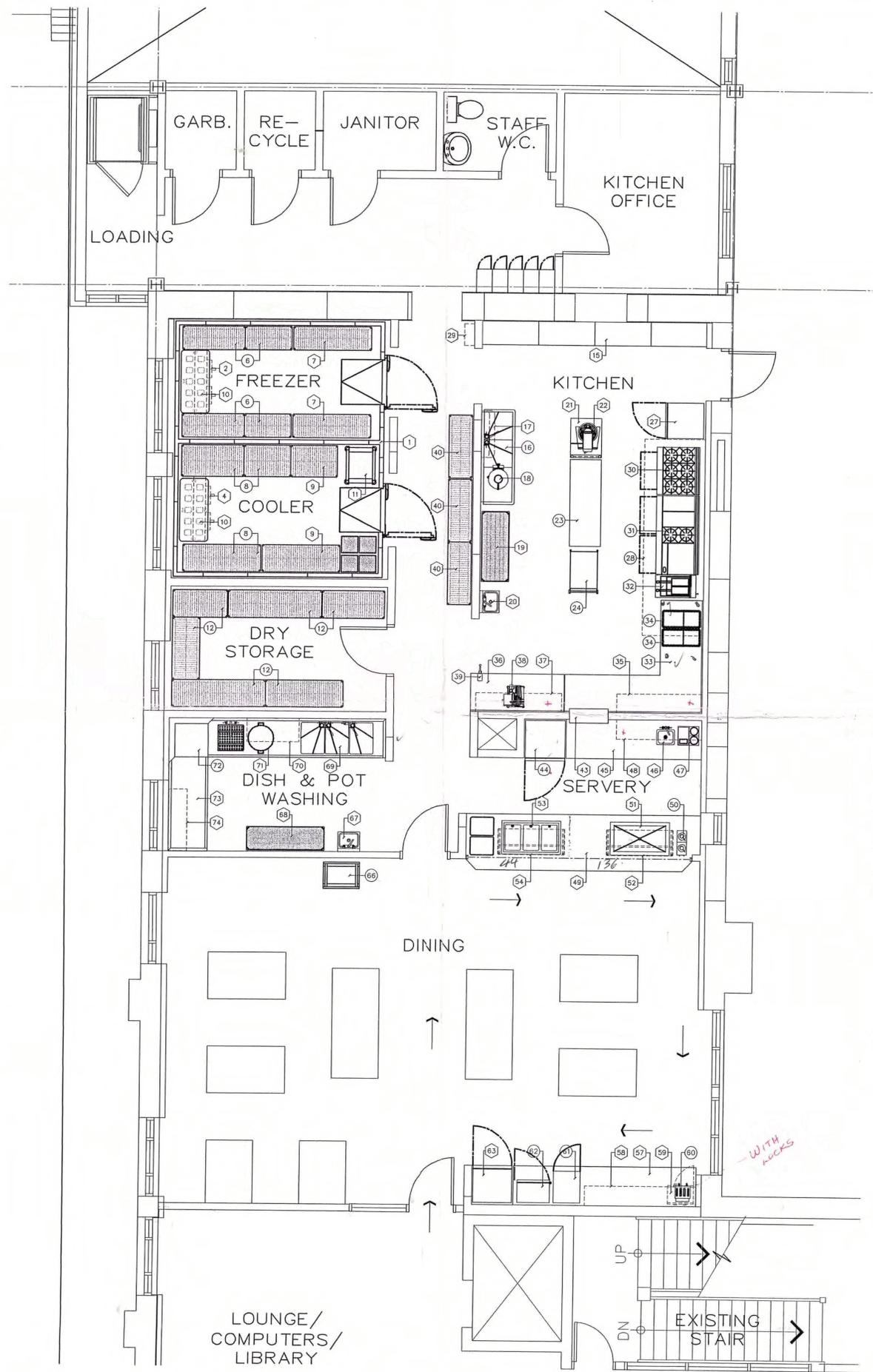
## 4.14 Room 327

**4.14.1** Outlet #1 is damaged. Recommend replacing with new receptacle. Refer to figure 4.14.1



**Figure 4.14.1**





FOODSERVICE EQUIPMENT SCHEDULE			
NO.	DESCRIPTION	Q'TY	NOTES
1	Walk-in Refrigerator/Freezer Assembly	1	
2	Evaporator Coil (Freezer)	1	
3	Condensing Unit (Freezer)	1	
4	Evaporator Coil (Refrig.)	1	
5	Condensing Unit (Refrig.)	1	
6	Freezer Shelving	4	Existing
7	Freezer Shelving	2	
8	Refrigerator Shelving	4	Existing
9	Refrigerator Shelving	1	
10	Dunnage Rack	2	
11	Mobile Angle Rack	1	
13	Unassigned	-	
14	Unassigned	-	
15	Pantry Shelving	Lot	
16	Preparation Sink	1	Existing
17	Utensil Rack	1	
18	Peeler	1	Existing
19	Clean Pot/Pan Rack	1	
20	Hand Sink	1	
21	Mixer Table	1	
22	20 Qt. Mixer	1	
23	Preparation Table	1	Existing
24	Mobile Utility Cart	1	Existing
25	Unassigned	-	
26	Unassigned	-	
27	Reach-in Refrigerator	1	
28	Exhaust Hood	1	Existing
29	Fire Suppression System	1	
30	Six Burner Range w/Oven	1	
31	Two Oven Range	1	Existing
32	Fryer	1	
33	Work Table	1	
34	Ingredient Bin	2	
35	Overshell	1	
36	Work Table	1	Existing
37	Overshell	1	
38	Slicer	1	Existing
39	Can Opener	1	
40	Storage Shelving	3	
41	Unassigned	-	
42	Unassigned	-	
43	Pass-Through Shelf	1	
44	Reach-in Refrigerator	1	Existing
45	Work Counter	1	
46	Drop-in Hand Sink	1	
47	Coffee Brewer	1	Existing
48	Overcupboard	1	
49	Servery Counter	1	
50	Coffee Warmer	1	Existing
51	Drop-in Refrigerated Well	1	
52	Food Shield Assembly	1	
53	Drop-in Hot Food Well	1	
54	Food Shield Assembly	1	
55	Unassigned	-	
56	Unassigned	-	
57	Buffet Counter	1	
58	Overcupboard	1	
59	Microwave Oven	1	
60	Toaster	1	Existing
61	Juice Dispenser	1	Existing
62	Milk Dispenser	1	Existing
63	Domestic Refrigerator	1	
64	Unassigned	-	
65	Unassigned	-	
66	Troy Return Cart	1	Existing
67	Hand Sink	1	
68	Clean Dish Storage Shelving	1	
69	Soiled Dish Table/Pot Sink	1	
70	Dishrack Overshell	1	
71	Waste Receptacle w/Daily	1	
72	Dishwasher	1	
73	Clean Dish Table	1	
74	Overshell	1	

DATE \_\_\_\_\_ REVISIONS \_\_\_\_\_

THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND REPORT ANY ERRORS OR OMISSIONS TO THE CONSULTANT BEFORE COMMENCING OR PROCEEDING WITH ANY WORK.

DO NOT SCALE THIS DRAWING.

**The Walter Fedy Partnership**  
ARCHITECTS AND ENGINEERS

548 BELMONT AVE. W.  
KITCHENER, ONTARIO  
N2M 1T5  
PHONE: (519) 576 2150  
FAX: (519) 576 5459

PROJECT

**YWCA RENEWAL  
84 FREDERICK STREET  
KITCHENER ONTARIO**

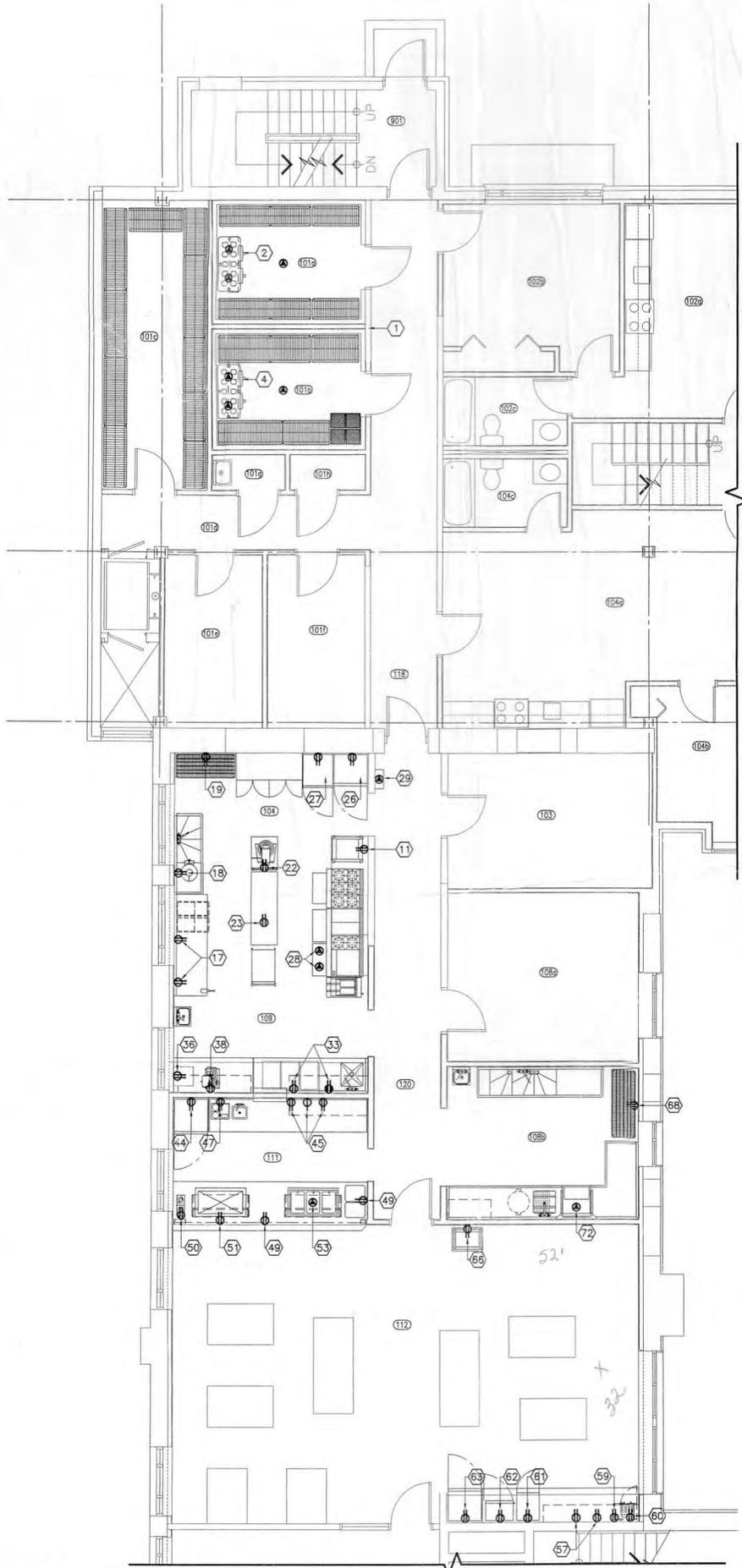
TITLE

**FOODSERVICE EQUIPMENT  
LAYOUT AND SCHEDULE**

SCALE	JOB No.	DRAWN BY
1/4"=1'-0"	2004-0433-10	ST
DATE	CAD FILE	CHECKED BY
FEB.18/05	5031F01B	ST

SHEET No.

**FS-1**

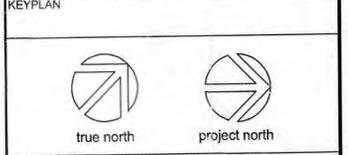
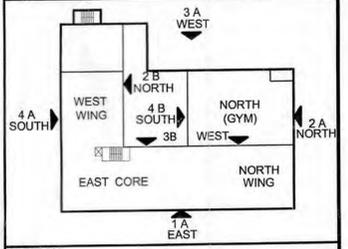


**1** NEW KITCHEN LAYOUT  
E4-1 3/16"=1'0"

WIRING FOR KITCHEN/BAR EQUIPMENT SCHEDULE							
F.S.C. ITEM NO.	NAME OR DESCRIPTION	NEW	EXISTING	VOLTAGE/PHASE	AMP (KW/HP)	RECEPTACLE MOUNTING THT.	REMARKS:
1	WALK-IN REFRIGERATOR/FREEZER ASSEMBLY			120/1	-	-	TWO DIRECT CONNECTIONS
2	EVAPORATOR COIL (FREEZER)			208/1	-	-	TWO DIRECT CONNECTIONS DRAIN LINE HEATER SUPPLIED BY E.
3	CONDENSING UNIT (FREEZER)			208/3	-	-	
4	EVAPORATOR COIL (REFRIG.)			120/1	4.2	-	TWO DIRECT CONNECTIONS
5	CONDENSING UNIT			208/1	-	-	DIRECT CONNECTION
11	MOBILE ANGLE RACK	✓		120/1	-	48" AFF	UTILITY RECEPTACLE BY E.
17	WORK TABLE	✓		120/1	-	48" AFF	TWO UTILITY RECEPTACLES BY E MOUNTED IN BACKSPLASH
18	PEELER		✓	120/1	6.4	48" AFF	PLUG IN; GFI RECEPTACLE BY E.
19	CLEAN POT/PAN RACK		✓	120/1	-	48" AFF	PLUG IN; UTILITY RECEPTACLE BY E.
22	20 QT. MIXER	NA	✓	120/1	10.0	48" AFF	PLUG IN; RECEPTACLE BY E.
23	PREPARATION TABLE		✓	120/1	-	48" AFF	UTILITY RECEPTACLE BY E.
26	REACH-IN FREEZER		✓	120/1	8.0	48" AFF	PLUG IN; RECEPTACLE BY E.
27	REACH-IN REFRIGERATOR		✓	120/1	7.6	48" AFF	PLUG IN; RECEPTACLE BY E.
28	EXHAUST HOOD		✓	120/1	0.3KW	-	TWO DIRECT CONNECTIONS
29	FIRE SUPPRESSION SYSTEM		✓	120/1	-	-	DIRECT CONNECTION
33	WORK TABLE W/ UTILITY SINK	✓		120/1	-	48" AFF	TWO GFI RECEPTACLES BY E.
36	WORK TABLE		✓	120/1	-	48" AFF	UTILITY RECEPTACLE BY E.
38	SLICER		✓	120/1	2.3	48" AFF	PLUG IN; RECEPTACLE BY E.
40	MICROWAVE OVEN		✓	120/1	10.0	66" AFF	PLUG IN; UTILITY RECEPTACLE BY E.
44	REACH-IN REFRIGERATOR		✓	120/1	10.0	48" AFF	PLUG IN; RECEPTACLE BY E.
45	WORK COUNTER		✓	120/1 208/1	2.8KW	48" AFF	UTILITY RECEPTACLE BY E. NEMA 6-20P RECEPTACLE BY E.
47	COFFEE BREWER		✓	120/1	12.5	48" AFF	PLUG IN; GFI RECEPTACLE BY E.
49	SERVERY COUNTER		✓	120/1	-	48" AFF	UTILITY RECEPTACLES BY E.
50	COFFEE WARMER		✓	120/1	12.5	48" AFF	PLUG IN; GFI RECEPTACLE BY E.
51	DROP-IN REFRIGERATED WELL		✓	120/1	7.0	48" AFF	PLUG IN; GFI RECEPTACLE BY E.
53	DROP-IN HOT FOOD WELL	NA	✓	208/3	10.3	-	DIRECT CONNECTION
57	BUFFET COUNTER		✓	120/1	-	48" AFF	UTILITY RECEPTACLES BY E.
59	MICROWAVE OVEN		✓	120/1	10.0	66" AFF	PLUG IN; RECEPTACLE BY E.
60	TOASTER		✓	208/1	2.8KW	48" AFF	NEMA 6-20P RECEPTACLE BY E.
61	JUICE DISPENSER		✓	120/1	9.0	48" AFF	PLUG IN; RECEPTACLE BY E.
62	MILK DISPENSER		✓	120/1	1.3	48" AFF	PLUG IN; RECEPTACLE BY E.
63	DOMESTIC REFRIGERATOR		✓	120/1	8.0	48" AFF	PLUG IN; RECEPTACLE BY E.
66	TRAY RETURN CART		✓	120/1	-	48" AFF	UTILITY RECEPTACLE BY E.
68	CLEAN DISH STORAGE SHELVING		✓	120/1	-	48" AFF	UTILITY RECEPTACLE BY E.
72	DISHWASHER		✓	120/1	14.0	-	DIRECT CONNECTION

**WIRING FOR KITCHEN EQUIP. - GENERAL NOTES**

- ELECTRICAL TO PROVIDE SEPARATE 120V AND 208V 1PH/3PH CONNECTION TO EVAPORATOR COIL AND COND. JUNCTION BOXES. PROVIDE DISCONNECT SWITCH AT CONDENSING UNIT AND FAN CONTROL SWITCH AT EVAPORATOR COIL. ELECTRICAL TO WIRE TO DOOR HEATER, 120V INTERIOR LIGHT ABOVE DOOR; SWITCH WITH PILOT LIGHT AND ONE ADDITIONAL FIXTURE BY K.E.S. REFER TO MANUFACTURERS WIRING DIAGRAM.
- CONNECT NEW FIRE SUPPRESSION SYSTEM TO KITCHEN HOOD DETECTION ZONE ON FIRE ALARM CONTROL PANEL.
- NOT USED
- ELECTRICAL TO SUPPLY AND INSTALL ALL RECEPTACLES (NEMA 5-15R) AS INDICATED. POWER SUPPLY THROUGH IN-FLOOR CONDUITS TO SINGLE FLUSH FLOOR JUNCTION BOX AND DISTRIBUTED TO OUTLET LOCATIONS WITH FLEXIBLE ARMoured CONDUIT.
- PROVIDE MAGNETIC TYPE STARTERS FOR KITCHEN HOODS EXHAUST FANS C/W H-0-A AND PILOTS (120V CONTROL) WIRED BY ELECTRICAL. REMOTE PUSHBUTTON CONTROL AT HOOD LOCATIONS AND F/A SHUTDOWN RELAYS BY ELECTRICAL.
- MECHANICAL TO SUPPLY ELECTRICALLY-HELD SOLENOID VALVES ON RELATED GAS FIRED EQUIPMENT LOCATED UNDER ALL EXHAUST HOODS. ELECTRICAL TO WIRE TO VALVES FOR SHUTDOWN OF GAS SUPPLY UPON SIGNAL FROM FIRE SUPPRESSION SYSTEM OR RELAY CONTROL.
- PROVIDE SHUNT TRIP BREAKERS IN NEW KITCHEN PANEL FOR ALL ELECTRICAL EQUIPMENT LOCATED UNDER KITCHEN EXHAUST HOOD ITEMS 3,6,7,29. REFER TO PANEL SCHEDULE FOR SELECTION.
- REFER TO FOOD SERVICE DRAWINGS PREPARED BY KITCHEN CONSULTANTS FOR EXACT CONNECTION POINT AND CONDUIT ENTRY REQUIREMENTS. ALL WIRING RUN UNDER FLOOR TO REMOTE EQUIPMENT LOCATIONS IN RIGID CONDUIT. USE WATER TIGHT CONNECTIONS IN ACCORDANCE WITH HYDRO INSPECTION REQUIREMENTS. USE FLEXIBLE CONDUIT FOR FINAL HARDWIRED EQUIPMENT CONNECTIONS.
- FREEZER DRAIN LINE HEAT TRACE AS RAYCHEM XL-TRACE (OR EQUAL), CAT. No. 5XL-1-CR 5 W/ft, 120V, C/W GFI BREAKER, AND AMC-18 BURIED PIPE THERMOSTAT AND TRANSFORMER AS REQUIRED.



I HAVE REVIEWED AND TAKEN RESPONSIBILITY FOR THE DESIGN WORK ON BEHALF OF THE WALTER FEDY PARTNERSHIP.

Signature: *David Buck*  
NAME: **DAVID BUCK**  
BCIN: **21610**

FEB 28/06 ISSUED FOR BUILDING PERMIT  
date revisions

customer  
**YWCA RENEWAL  
84 FREDERICK STREET  
KITCHENER, ONTARIO**

project

title  
**ENLARGED PLANS**

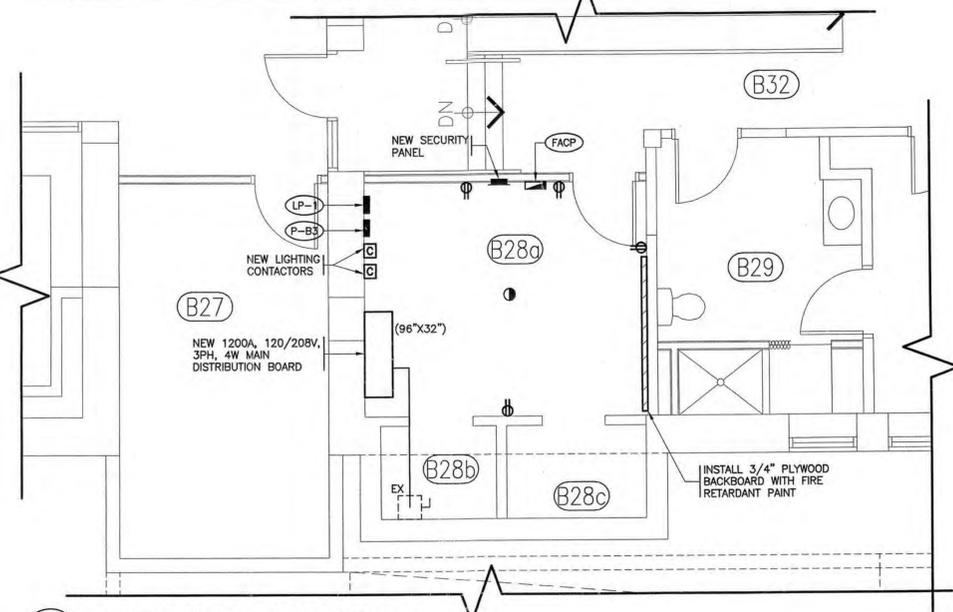
**THE walterfedy PARTNERSHIP**  
ARCHITECTS • ENGINEERS  
546 Belmont Ave. W., Kitchener, Ontario, N2M 5E3  
P: 519-576-2150 F: 519-576-5499 www.twfp.com

The contractor shall check and verify all dimensions and report any errors or omissions to the consultant before commencing or proceeding with any work. Do not scale this drawing.

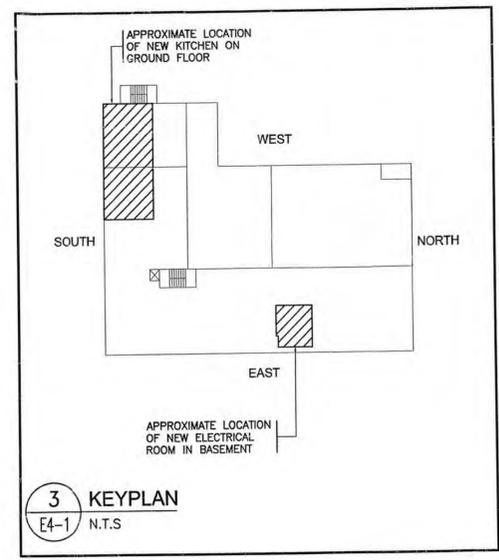
**D. C. BUCK**  
REGISTERED PROFESSIONAL ENGINEER  
PROVINCE OF ONTARIO

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scale: AS NOTED  
date: 02/22/2006  
job no.: 2004-0433-10  
CAD file: E4-1\_2004-0433-10  
drawn by: JP  
checked by:

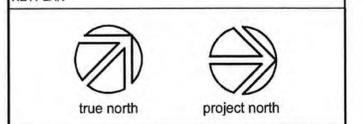
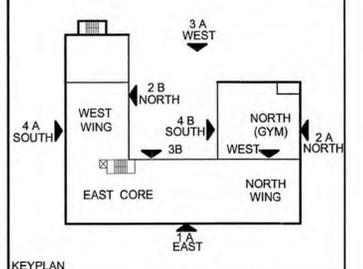
BCIN: sheet no.:  
**E4-1**



**2** NEW ELECTRICAL ROOM LAYOUT  
E4-1 1/4"=1'0"



**3** KEYPLAN  
E4-1 N.T.S



I HAVE REVIEWED AND TAKEN RESPONSIBILITY FOR THE DESIGN WORK ON BEHALF OF THE WALTER FEDY PARTNERSHIP.

SIGNATURE: *E. J. Fowler*  
 NAME: ED FOWLER  
 BCIN: 21019

FEB 28/06 ISSUED FOR BUILDING PERMIT  
 date revisions

customer  
**YWCA**  
 84 FREDERICK STREET  
 KITCHENER, ONTARIO

project  
**YWCA RENEWAL**  
 845 FREDERICK STREET  
 KITCHENER, ONTARIO

title  
**BASEMENT FLOOR PLAN  
 DEMOLITION LAYOUT**

**the walterfedy**  
 PARTNERSHIP  
 ARCHITECTS • ENGINEERS

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 P. 519-576-2150 F. 519-576-5499 www.wfwp.com

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 date: OCT 27/05  
 job no.: 2004-0433-10  
 CAD file: M2-1\_2004-0433-10  
 drawn by: CR  
 checked by:

BCIN:  
 sheet no.:  
**MD-1**

### RADIATION SCHEDULE

**BASEBOARD**

BB-60	STIRLING	TYPE-LENGTH(ft.)
4.6		MBH RATING

BB - MODEL KP 3-50-2  
 460 BTU/LINEAR FT - 8 1/2" HIGH

**CONVECTORS**

W1-8'-0"	SIGMA	TYPE-DEPTH(ft.)
48"-9.4"		LENGTH(ft.)-MBH RATING

W - TYPE CWF, 20" HIGH, WALL MOUNTED, 8" WIDTH  
 S - TYPE CWF, 20" HIGH, SEMI RECESSED, 8" WIDTH

**UNIT HEATERS**

UH1-MAX	SIGMA	TYPE-MOUNTING HTG.(in.)
35.0		MBH RATING

UH1 - MODEL G30H, HORIZONTAL UNIT HEATERS,  
 420 CFM, 1/20 HP, 1.1 AMPS, 850 RPM MOTOR

BASED ON 180°F ENTERING WATER TEMPERATURE  
 WITH 40°F TEMPERATURE DROP

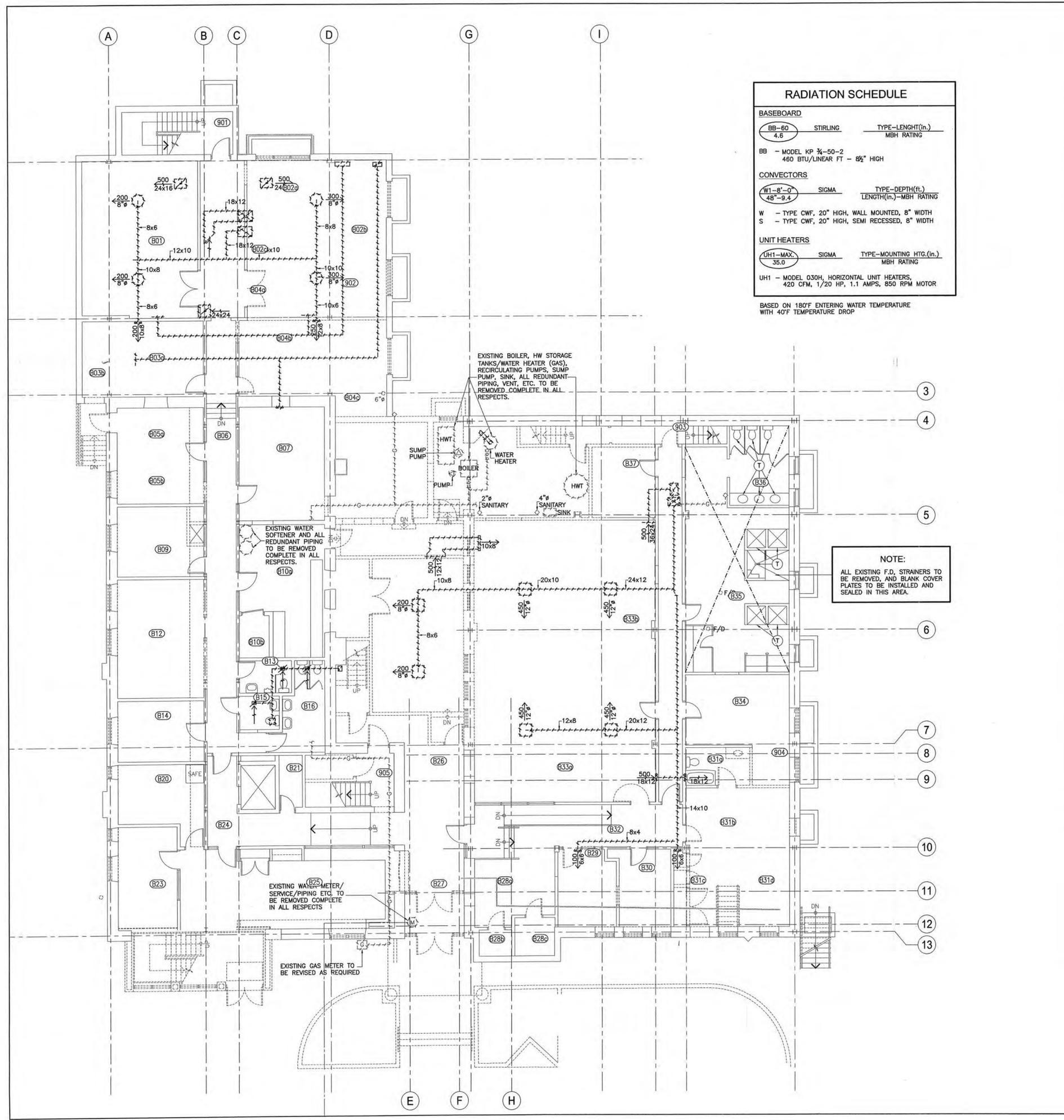
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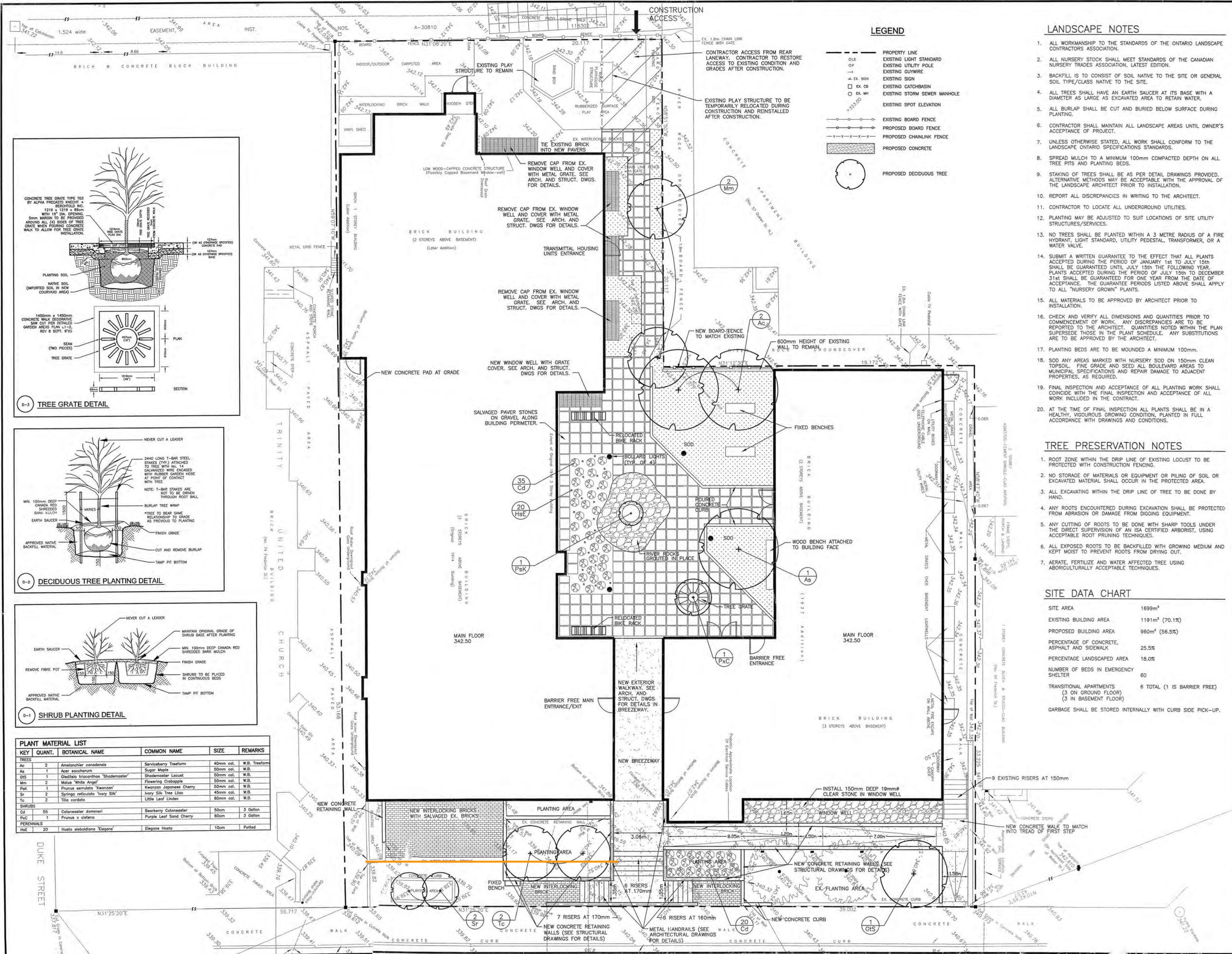
	SANITARY DRAIN (BELOW FLOOR)
	SANITARY DRAIN (AT CEILING)
	STORM DRAIN (BELOW FLOOR)
	STORM DRAIN (AT CEILING)
	COLD HARD WATER
	HOT WATER
	HOT WATER RECIRCULATING LINE
	COLD SOFT WATER
	PRIME LINE
	PUMP DISCHARGE (PLUMBING)
	DRAIN LINE
	LAVATORY
	WC WATER CLOSET
	SH SHOWER
	S SINK
	SS SERVICE SINK
	HB HOSE BIBB
	RH ROOF HOPPER
	RWL RAIN WATER LEADER
	CO CLEAN OUT
	HD HUB DRAIN
	FD FLOOR DRAIN
	FFD FUNNEL FLOOR DRAIN
	G GAS LINE
	GAS COCK
	GATE VALVE
	GLOBE VALVE
	CHECK VALVE
	AUTOMATIC CONTROL VALVE (ACV)
	3-WAY MIXING VALVE
	ELECTRICALLY SUPERVISED VALVE
	BACKFLOW PREVENTOR
	PRESSURE RELIEF VALVE
	STRAINER
	ANCHOR
	UNION
	TEMPERATURE GAUGE
	PRESSURE GAUGE
	REHEAT COIL
	HOT WATER HEATING SUPPLY
	HOT WATER HEATING RETURN
	CIRCUIT BALANCING VALVE
	AUTOMATIC AIR VENT
	SUPPLY DUCT
	RETURN OR EXHAUST DUCT
	FLEXIBLE CONNECTION
	MOTORIZED DAMPER
	FIRE DAMPER
	MANUAL BALANCING DAMPER
	CUBIC FEET PER MINUTE
	GRILLE SIZE
	RETURN AIR OR EXHAUST GRILLE
	SUPPLY AIR GRILLE OR DIFFUSER
	THERMOSTAT
	EXHAUST FAN
	OPPOSED BLADE VOLUME CONTROL DAMPER
	LOW VELOCITY SOUND INSULATION
	EXISTING TO BE REMOVED
	EXISTING TO REMAIN

**NOTE:**  
 ALL EXISTING F.D. STRAINERS TO BE REMOVED, AND BLANK COVER PLATES TO BE INSTALLED AND SEALED IN THIS AREA.

**GENERAL NOTES:**

- (A) CONNECT TO EXISTING AT APPROX. THIS LOCATION
- (B) EXISTING PIPING TO REMAIN
- (T) REMOVE EXISTING PLUMBING FIXTURES AND ALL REDUNDANT PIPING COMPLETE IN ALL RESPECTS. CAP DRAINS AND PIPING BELOW FLOOR OR IN WALLS AT WATER MAINS.





**LEGEND**

- PROPERTY LINE
- EXISTING LIGHT STANDARD
- EXISTING UTILITY POLE
- EXISTING GUYWIRE
- EXISTING SIGN
- EXISTING CATCHBASIN
- EXISTING STORM SEWER MANHOLE
- EXISTING SPOT ELEVATION
- EXISTING BOARD FENCE
- PROPOSED BOARD FENCE
- PROPOSED CHAINLINK FENCE
- PROPOSED CONCRETE
- PROPOSED DECIDUOUS TREE

**LANDSCAPE NOTES**

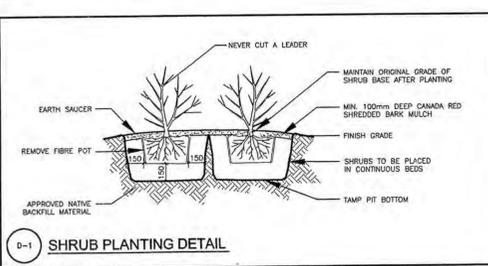
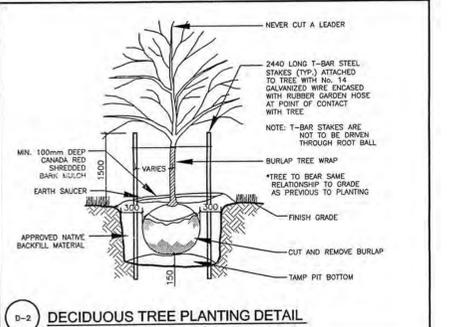
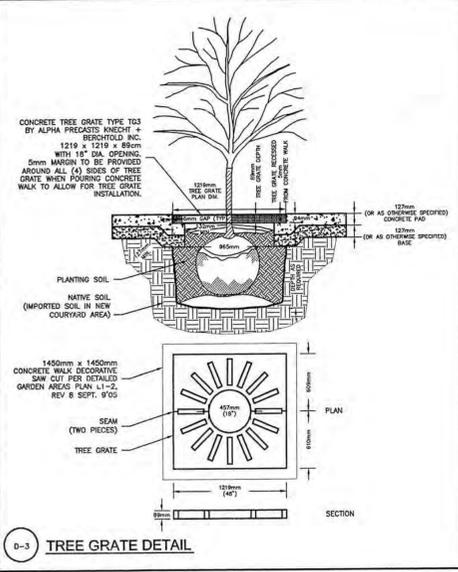
1. ALL WORKMANSHIP TO THE STANDARDS OF THE ONTARIO LANDSCAPE CONTRACTORS ASSOCIATION.
2. ALL NURSERY STOCK SHALL MEET STANDARDS OF THE CANADIAN NURSERY TRADES ASSOCIATION, LATEST EDITION.
3. BACKFILL IS TO CONSIST OF SOIL NATIVE TO THE SITE OR GENERAL SOIL TYPE/CLASS NATIVE TO THE SITE.
4. ALL TREES SHALL HAVE AN EARTH SAUCER AT ITS BASE WITH A DIAMETER AS LARGE AS EXCAVATED AREA TO RETAIN WATER.
5. ALL BURLAP SHALL BE CUT AND BURIED BELOW SURFACE DURING PLANTING.
6. CONTRACTOR SHALL MAINTAIN ALL LANDSCAPE AREAS UNTIL OWNER'S ACCEPTANCE OF PROJECT.
7. UNLESS OTHERWISE STATED, ALL WORK SHALL CONFORM TO THE LANDSCAPE ONTARIO SPECIFICATIONS STANDARDS.
8. SPREAD MULCH TO A MINIMUM 100mm COMPACTED DEPTH ON ALL TREE PITS AND PLANTING BEDS.
9. STAKING OF TREES SHALL BE AS PER DETAIL DRAWINGS PROVIDED. ALTERNATIVE METHODS MAY BE ACCEPTABLE WITH THE APPROVAL OF THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
10. REPORT ALL DISCREPANCIES IN WRITING TO THE ARCHITECT.
11. CONTRACTOR TO LOCATE ALL UNDERGROUND UTILITIES.
12. PLANTING MAY BE ADJUSTED TO SUIT LOCATIONS OF SITE UTILITY STRUCTURES/SERVICES.
13. NO TREES SHALL BE PLANTED WITHIN A 3 METRE RADIUS OF A FIRE HYDRANT, LIGHT STANDARD, UTILITY PEDESTAL, TRANSFORMER, OR A WATER VALVE.
14. SUBMIT A WRITTEN GUARANTEE TO THE EFFECT THAT ALL PLANTS ACCEPTED DURING THE PERIOD OF JANUARY 1st TO JULY 15th SHALL BE GUARANTEED UNTIL JULY 15th THE FOLLOWING YEAR. PLANTS ACCEPTED DURING THE PERIOD OF JULY 15th TO DECEMBER 31st SHALL BE GUARANTEED FOR ONE YEAR FROM THE DATE OF ACCEPTANCE. THE GUARANTEE PERIODS LISTED ABOVE SHALL APPLY TO ALL "NURSERY GROWN" PLANTS.
15. ALL MATERIALS TO BE APPROVED BY ARCHITECT PRIOR TO INSTALLATION.
16. CHECK AND VERIFY ALL DIMENSIONS AND QUANTITIES PRIOR TO COMMENCEMENT OF WORK. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ARCHITECT. QUANTITIES NOTED WITHIN THE PLAN SUPERSEDE THOSE IN THE PLANT SCHEDULE. ANY SUBSTITUTIONS ARE TO BE APPROVED BY THE ARCHITECT.
17. PLANTING BEDS ARE TO BE MOUND A MINIMUM 100mm.
18. SOD ANY AREAS MARKED WITH NURSERY SOD ON 150mm CLEAN TOPSOIL. FINE GRADE AND SEED ALL BOULEVARD AREAS TO MUNICIPAL SPECIFICATIONS AND REPAIR DAMAGE TO ADJACENT PROPERTIES, AS REQUIRED.
19. FINAL INSPECTION AND ACCEPTANCE OF ALL PLANTING WORK SHALL COINCIDE WITH THE FINAL INSPECTION AND ACCEPTANCE OF ALL WORK INCLUDED IN THE CONTRACT.
20. AT THE TIME OF FINAL INSPECTION ALL PLANTS SHALL BE IN A HEALTHY, VIGOROUS GROWING CONDITION, PLANTED IN FULL ACCORDANCE WITH DRAWINGS AND CONDITIONS.

**TREE PRESERVATION NOTES**

1. ROOT ZONE WITHIN THE DRIP LINE OF EXISTING LOCUST TO BE PROTECTED WITH CONSTRUCTION FENCING.
2. NO STORAGE OF MATERIALS OR EQUIPMENT OR PILING OF SOIL OR EXCAVATED MATERIAL SHALL OCCUR IN THE PROTECTED AREA.
3. ALL EXCAVATING WITHIN THE DRIP LINE OF TREE TO BE DONE BY HAND.
4. ANY ROOTS ENCOUNTERED DURING EXCAVATION SHALL BE PROTECTED FROM ABRASION OR DAMAGE FROM DIGGING EQUIPMENT.
5. ANY CUTTING OF ROOTS TO BE DONE WITH SHARP TOOLS UNDER THE DIRECT SUPERVISION OF AN ISA CERTIFIED ARBORIST, USING ACCEPTABLE ROOT PRUNING TECHNIQUES.
6. ALL EXPOSED ROOTS TO BE BACKFILLED WITH GROWING MEDIUM AND KEPT MOIST TO PREVENT ROOTS FROM DRYING OUT.
7. AERATE, FERTILIZE AND WATER AFFECTED TREE USING AGRICULTURALLY ACCEPTABLE TECHNIQUES.

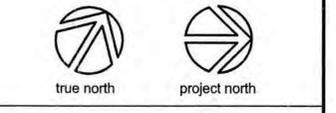
**SITE DATA CHART**

SITE AREA	1699m <sup>2</sup>
EXISTING BUILDING AREA	1191m <sup>2</sup> (70.1%)
PROPOSED BUILDING AREA	960m <sup>2</sup> (56.5%)
PERCENTAGE OF CONCRETE, ASPHALT AND SIDEWALK	25.5%
PERCENTAGE LANDSCAPED AREA	18.0%
NUMBER OF BEDS IN EMERGENCY SHELTER	60
TRANSITIONAL APARTMENTS (3 ON GROUND FLOOR) (3 IN BASEMENT FLOOR)	6 TOTAL (1 IS BARRIER FREE)
GARBAGE SHALL BE STORED INTERNALLY WITH CURB SIDE PICK-UP.	



**PLANT MATERIAL LIST**

KEY	QUANT.	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
<b>TREES</b>					
Ac	2	Amelanchier canadensis	Servicberry Treeform	40mm col.	W.B. Treeform
As	1	Acer saccharum	Sugar Maple	50mm col.	W.B.
GIS	1	Gladiolus triacanthos 'Shademaster'	Shademaster Gladiolus	50mm col.	W.B.
Mn	2	Malus 'White Angel'	Flowering Crabapple	50mm col.	W.B.
Psk	1	Prunus serrulata 'Kwanzan'	Kwanon Japanese Cherry	50mm col.	W.B.
Sr	2	Syringa reticulata 'Ivory Silk'	Ivory Silk Tree Lilac	45mm col.	W.B.
Tc	2	Tilia cordata	Little Leaf Linden	60mm col.	W.B.
<b>SHRUBS</b>					
Cd	55	Coloneaster dammeri	Beachberry Coloneaster	50cm	3 Gallon
PxC	1	Prunus x cistena	Purple Leaf Sand Cherry	60cm	3 Gallon
<b>PERENNIALS</b>					
HsE	20	Hosta sieboldiana 'Elegans'	Elegans Hosta	10cm	Potted



**GENERAL NOTES**

1. LEGAL PROPERTY LINE AND TOPOGRAPHICAL INFORMATION TAKEN FROM TOPOGRAPHICAL SURVEY OF PART OF LOTS 4 AND 5 R. P. 388 IN THE CITY OF KITCHENER BY LETZ & LORENTZ LTD. DATED DECEMBER 23, 2004.
2. LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THESE SERVICES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL DAMAGES THAT OCCUR DUE TO HIS FAILURE TO LOCATE AND PRESERVE THESE SERVICES.
3. ANY AREA DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO ITS EXISTING CONDITION OR BETTER TO THE SATISFACTION OF THE OWNER AND MUNICIPALITY. THIS INCLUDES ASPHALT, GRANULAR, PAVING STONE, TOPSOIL, SOD, ETC.

**BENCHMARK**

TOP OF HORIZONTAL CONTROL MONUMENT NO. 029893418 (BEING A BRASS PLUG SET IN THE CURB AT THE MOST NORTHERLY CORNER OF THE INTERSECTION OF KING STREET AND FREDERICK STREET), IT BEING ASSUMED 335.144 METRES (AS PUBLISHED ON A TOPOGRAPHICAL SURVEY PREPARED FOR THE CITY OF KITCHENER, BEARING OUR FILE NUMBER K1-618-26) WHICH WAS RELATED TO A PREVIOUS GEODETIC BENCH MARK (NO. 670047) WHICH HAD BEEN DISTURBED.

FEB.27/06	ISSUED FOR BUILDING PERMIT
FEB.03/06	ISSUED FOR SITE PLAN APPROVAL
date	revisions

**customer**

**YWCA**  
84 FREDERICK STREET  
KITCHENER, ONTARIO

**project**

**YWCA RENEWAL**  
84 FREDERICK STREET  
KITCHENER, ONTARIO

**title**

**SITE PLAN AND LANDSCAPE PLAN**



546 Belmont Ave. W., Kitchener, Ontario, N2M 5E3  
P. 519-576-2150 F. 519-576-5499 www.wfwp.com

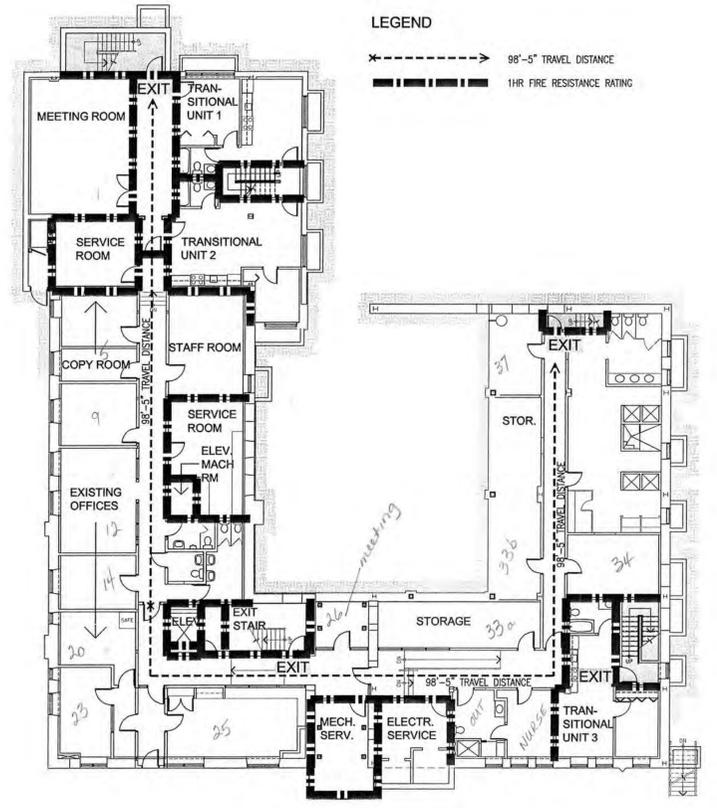
The contractor shall check and verify all dimensions and report any errors or omissions to the consultant before commencing or proceeding with any work. Do not scale this drawing.



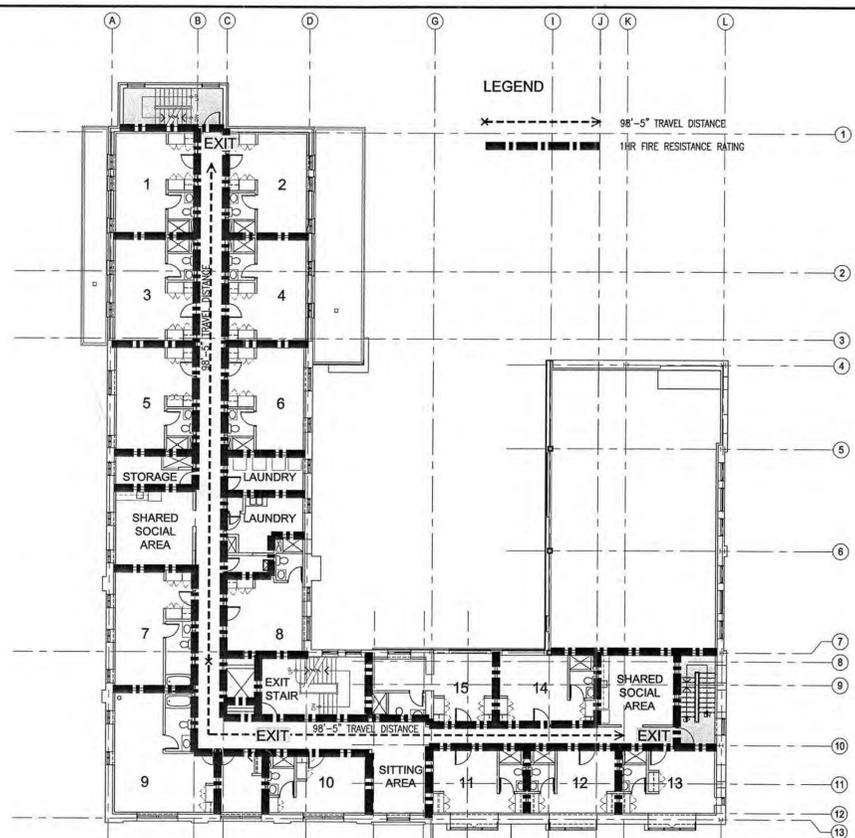
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scale: 1:100  
date: FEB 27/06  
job no.: 204-0433-10  
CAD file: C1-1\_2004-0433-10  
drawn by: A.H.  
checked by:

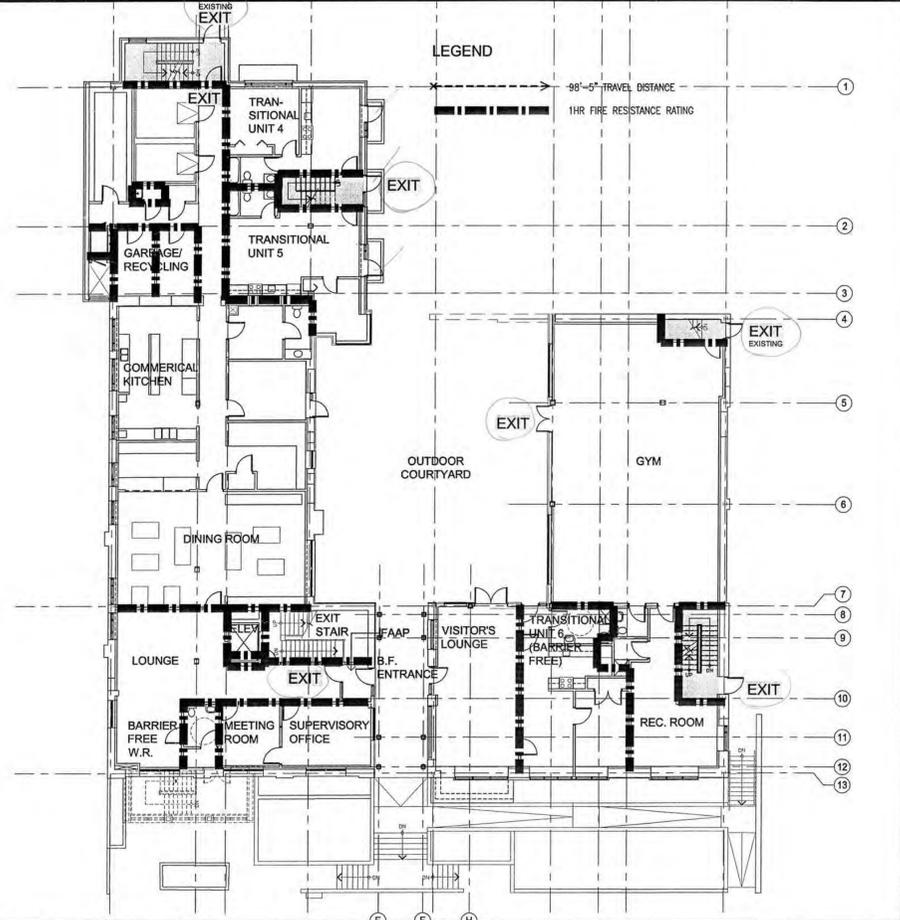
BCN no.:  
sheet no.:  
**C1-1**



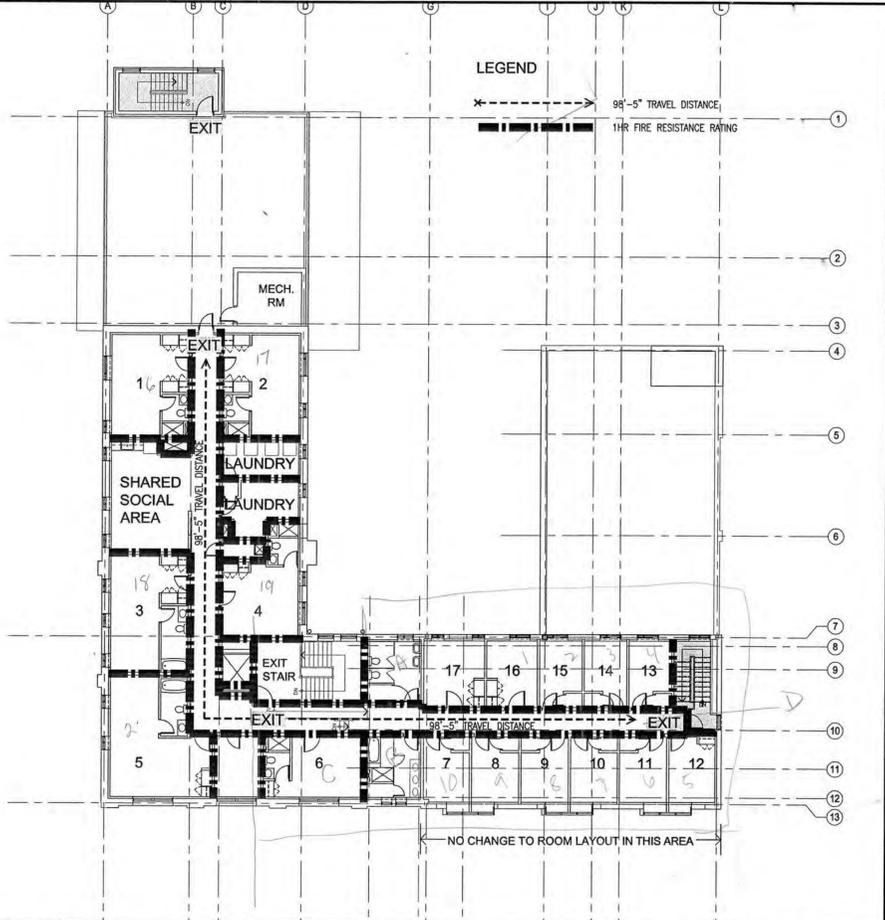
1 BASEMENT FLOOR PLAN  
A1-01 1/16" = 1'-0"



3 SECOND FLOOR PLAN  
A1-01 1/16" = 1'-0"



2 GROUND FLOOR PLAN  
A1-01 1/16" = 1'-0"



4 THIRD FLOOR PLAN  
A1-01 1/16" = 1'-0"

**Building Code Analysis**

Existing building is a C (Residential) occupancy combustible construction, with theoretical 1 hour floor-to-floor fire rating.

New Construction - Group C

Building Area: Existing = 12,805 sq.ft.  
Area being demolished = 2,933 sq.ft.  
New Building Area - (existing minus demolished) = 9,872 sq.ft.  
Facing 1 street Unsprinklered

Part 3 requirements (for new construction)

3.2.2.43 - C up to 6 storeys, facing 1 street, unsprinklered  
3 storey maximum building area = 4,000 sq.m, (43,100 sq.ft)

Non-combustible construction required.

1 hour floor-to-floor rated fire separation

1 hour fire resistance rating on load-bearing elements (walls, columns)  
Mezzanines require 1 hour fire resistance rating

1 hour fire resistance rating required on roof.

Assemblies supporting roof require an equivalent fire rating

3.3.4.2. A 1-hour fire separation is required between suites, and between suites and remainder of the building.

3.3.4.3. Storage room for residents possessions to be separated with a 1 hour fire rated separation, and have sprinklers.

3.2.9. Standpipe not required.

Egress:

3.4.2.5. (1)(f) Maximum travel distance - 30metres (98'-5") to nearest of 2 exits.

3.4.3.1.(2)(b) 2'-11" - minimum width of exit stairs (serving not more than 3 storeys above grade)

3.4.3.1.(2)(e) 2'-7" - minimum width of exit doorways

3.4.3.1.(2)(e) 3'-7" - corridors + passageways

Fire Alarm:

3.2.4.1.(2)(i): Fire Alarm system is required - single or stage [3.2.4.3.(1)(e)]

Part 11 requirements (for renovated areas)

Renovation is to approx. 90% of existing floor area.

There is a change in major occupancy - from "Assembly" (daycare component) to "Residential"

Hazard Index of Residence: Medium size, Dormitory / Hostel = H.I.4 (Table 11.2.1.1.1.)  
Hazard Index of Daycare: Medium size, Day care = H.I. 4 (Table 11.2.1.1.C)

Construction Index = C.I.4, assuming floors have a 45minute rating.

The performance level must be maintained.

Performance level

11.4.2.1. Structural  
Performance level is reduced where the major occupancy is changed and the existing floor and structure after construction are not adequate to support the proposed dead and live loads.

11.4.2.2. Occupant load  
Occupant load of existing building: residential care = 60 residents  
Staff = 17  
Daycare = 58  
Staff = 13

Total Building Occupancy Load Existing = 148

Occupant load of new building: residential care = 60 residents  
Staff = 17  
Daycare = 0  
Staff = 0  
Transitional housing units = 5 @ 2 persons = 10

Total Building Occupancy Load new = 87

Decrease in occupant load of 40%

11.4.2.3. Change in Major Occupancy  
The new major occupancy has an equivalent hazard index, and so the performance level is not reduced under this article.

EW/EVAC systems must be evaluated and upgraded per 11.4.3.3(2):

- Access to exits based on section 3.3.1.
- Exit widths based on section 3.3.1.
- Exit signs to 3.4.5.
- Exit lighting and emergency exit lighting upgrade
- Fire alarm system
- Travel distance and number of exits

Note: Existing fire separations which do not comply with current Code requirements are NOT required to be upgraded. Infilling openings in existing walls can match existing construction type, whether wood framing or steel.

Where a non-complying assembly (wall, floor, ceiling) is substantially removed, it MUST be put back in compliance with Part 3 new construction requirements.

Compensating construction

11.4.3.4. no additional upgrading is required in conformance with Table 11.4.3.4.A, because the C.I and the H.I. are already equal.

11.4.3.4.(2) does not apply.

Washrooms:

Barrier-Free requirements:

The building is required to have 1 barrier-free entrance. This will be the new shelter entrance, which will also be the new public entrance. Power door operators, and a clear door width of 2'-8" are required.

The washroom in the front lobby will be barrier-free.

11.4.3.3.(3). Plumbing fixtures in area of increased occupancy load are required to be upgraded per 3.7.4.2.

Items discussed and agreed with City of Kitchener: Feb 20/06

Existing corridor walls consisting of 1/2" plaster on wood lath, on 2x6 wood studs @ 16" c/s achieve 30 minute fire resistance rating per "Archaic materials" document and NBC Supplement.  
30 minute rating is acceptable for existing walls between suites and between suite & corridor.  
New construction of walls between suites and between suite & corridor to be 1 hour fire per Part 3 OBC. Where existing door openings are being infilled, but wall is otherwise intact, matching existing construction is adequate.

Existing main communication stair (combustible construction, existing handrails not per OBC) will be accepted as an exit stair from basement to ground (Other floors do not require this stair to be treated as an exit since travel distances to 2 other exit stairs are within limits of 3.4.2.5) This stair is the main stair used by occupants in the building and is therefore the de facto exit stair for the building. At ground floor, this stair exits through a lobby. The lobby is not required to be sprinklered, but is required to be fire separated with 1 hour f.r.r. (3.3.4.2), except for the RCW office and associated meeting room. For these rooms, a fire separation is required with 0 f.r.r.

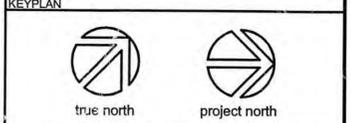
Transitional units ground level and basement level at internal courtyard have access from the exterior. The ground floor units will have a door directly accessing the courtyard in addition to the main stair entrance. 3.3.4.4.(3)

3.3.4.4. (6) permits basement units to open directly into exit stair, provided a second exit exists - to internal corridor. Therefore this area of the building is not cut off from the remainder of the building, and the provisions of 3.2.5.5. (4) and 3.3.4.4. are satisfied. The internal corridor will be a "public corridor" and therefore requires a 1 hr f.r.r. separation: existing walls and door require upgrading.

Space labeled as "gym" and barrier free unit at ground level are primarily accessed from the courtyard. The gym will have a door from the basement level, thereby satisfying requirements of 3.2.5.5. (4). The barrier free transitional unit will have a fire fighter access door from the building in addition to the front door of this unit which is at the courtyard, thereby providing fire fighter access through the building within the 45m limit. (measured to principle entrance)

Commercial kitchen does not require fire separation to remainder of building other than floor to floor rating / separation required under 3.2.2.

5 OBC REVIEW  
A1-01



I HAVE REVIEWED AND TAKEN RESPONSIBILITY FOR THE DESIGN WORK ON BEHALF OF THE WALTER FEDY PARTNERSHIP.

SIGNATURE: *FEI WEI*

NAME: FEI WEI

BCIN: 19953

FEB 28/06	ISSUED FOR BUILDING PERMIT
FEB 03/06	ISSUED FOR SITE PLAN APPROVAL
date	revisions

customer  
**YWCA**  
84 FREDERICK STREET  
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**BUILDING CODE ANALYSIS**



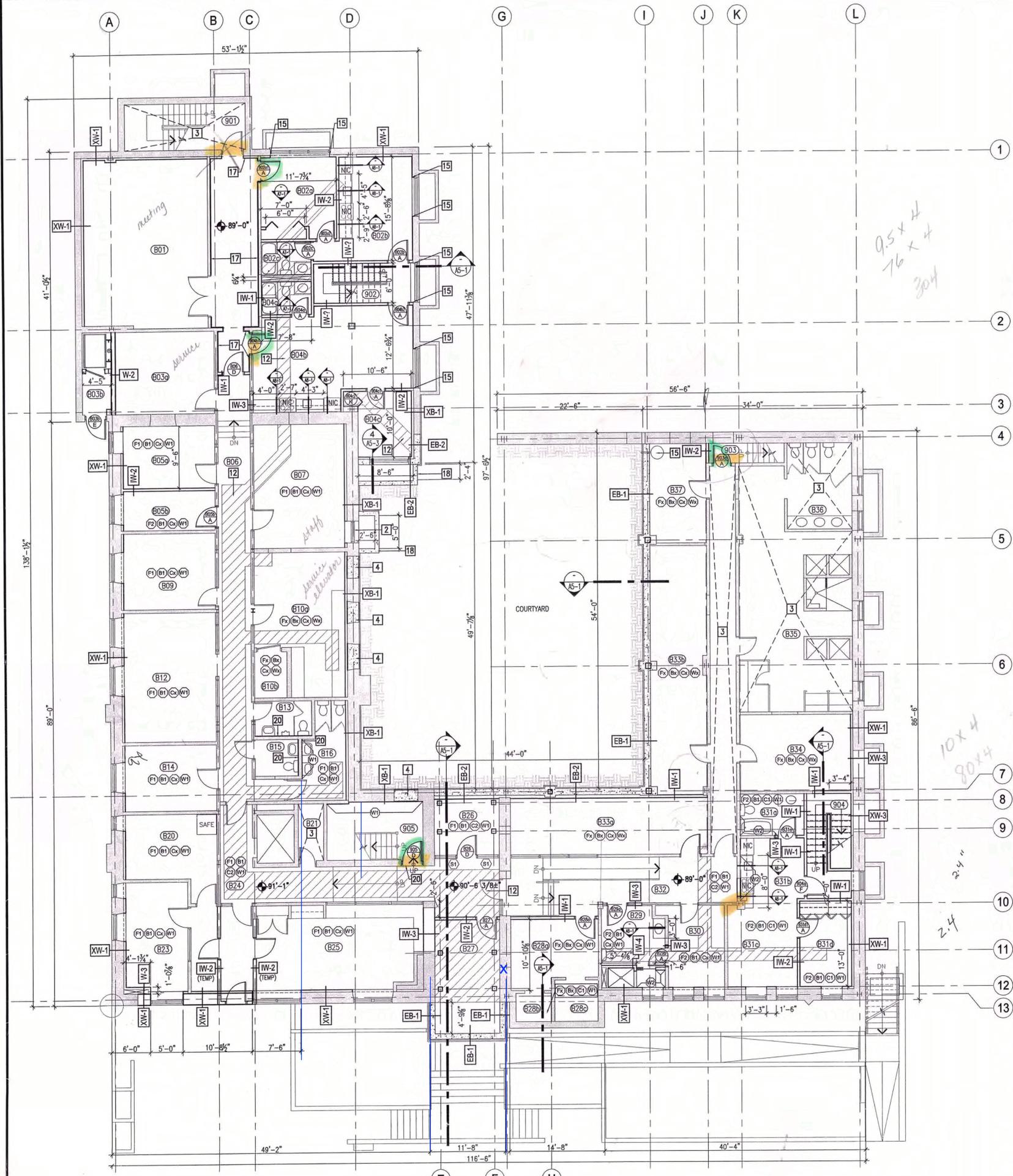
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P: 519-576-2150 F: 519-576-5499 www.wtfp.com

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scale: 1/16" = 1'-0"  
date: FEB 28/06  
job no: 2004-0433-10  
CAD file: A1-1\_2004043310  
drawn by: MB  
checked by:

BCIN: sheet no:  
**A1-1**



- WALL TYPE LEGEND**
- EXISTING WALL ASSEMBLY**
  - XW-1 EXTERIOR WALL INSULATION**
    - 5/8" GYPSUM BOARD
    - VAPOUR BARRIER (TAPE AND SEAL ALL JOINTS)
    - MINERAL WOOL INSULATION R13.5
    - 3-5/8" METAL STUDS @ 16" O.C.
    - AIR BARRIER
    - EXISTING WALL ASSEMBLY
  - XW-2 EXISTING EXTERIOR WALL WOOD CLADDING**
    - 5/8" GYPSUM BOARD
    - VAPOUR BARRIER (TAPE AND SEAL ALL JOINTS)
    - MINERAL WOOL INSULATION R13.5
    - 3-5/8" METAL STUDS @ 16" O.C.
    - AIR BARRIER
    - EXISTING WALL ASSEMBLY
    - MOISTURE BARRIER
    - 1" VERTICAL WOOD STRAPPING @ 16" O.C.
    - WOOD CLADDING, TONGUE AND GROOVE
  - XW-3 EXISTING EXTERIOR WALL INFILL1**
    - GYPSUM BOARD (TO BE FLUSH WITH EXISTING WALL FACE)
    - METAL STUDS
    - 5-1/2" CONCRETE BLOCK
    - SALVAGED BRICK (TOOTHIN FLUSH WITH EXISTING WALL FACE)
  - XW-4 EXISTING EXTERIOR WALL INFILL2**
    - (OVERALL WALL WIDTH TO MATCH EXISTING)
    - 5/8" GYPSUM BOARD (TO BE FLUSH WITH EXISTING WALL FACE)
    - VAPOUR BARRIER (TAPE AND SEAL ALL JOINTS)
    - MINERAL WOOL INSULATION R13.5
    - METAL STUDS @ 16" O.C.
    - AIR BARRIER
    - 1" AIRSPACE
    - SALVAGED BRICK (TOOTHIN-FLUSH WITH EXISTING WALL FACE)
  - XW-5 EXISTING EXTERIOR WALL CERAMIC TILE CLADDING**
    - 5/8" GYPSUM BOARD
    - VAPOUR BARRIER (TAPE AND SEAL ALL JOINTS)
    - MINERAL WOOL INSULATION R13.5
    - 3-5/8" METAL STUDS @ 16" O.C.
    - AIR BARRIER
    - EXISTING WALL ASSEMBLY
    - 1" METAL FURRING CHANNEL @ 16" O.C. (MECHANICALLY FASTENED)
    - 1/2" CEMENT BOARD
    - THIN SET EPOXY MORTAR BED
    - PORCELAIN TILE
  - XB-1 EXISTING BASEMENT WALL**
    - 5/8" GYPSUM BOARD
    - VAPOUR BARRIER (TAPE AND SEAL ALL JOINTS)
    - MINERAL WOOL INSULATION R13.5
    - 3-5/8" METAL STUDS @ 16" O.C.
    - AIR BARRIER
    - EXISTING WALL ASSEMBLY
    - WATERPROOFING MEMBRANE
    - 2" RIGID INSULATION, FULL HEIGHT
    - DRAINAGE BOARD
    - WEEPING TILES (CONNECT TO EXISTING SYSTEM WHERE EXCAVATED)
  - EB-1 BASEMENT WALL**
    - REINFORCED POURED CONCRETE (REFER TO STRUCTURAL DRAWINGS)
    - WATERPROOFING MEMBRANE
    - 2" RIGID INSULATION, FULL HEIGHT
    - DRAINAGE BOARD
    - WEEPING TILES (CONNECT TO EXISTING SYSTEM)
  - EB-2 BASEMENT WALL FINISHED INTERIOR**
    - 5/8" GYPSUM BOARD
    - VAPOUR BARRIER (TAPE AND SEAL ALL JOINTS)
    - MINERAL WOOL INSULATION R13.5
    - 3-5/8" METAL STUDS @ 16" O.C.
    - AIR BARRIER
    - REINFORCED POURED CONCRETE (REFER TO STRUCTURAL DRAWINGS)
    - WATERPROOFING MEMBRANE
    - 2" RIGID INSULATION, FULL HEIGHT
    - DRAINAGE BOARD
    - WEEPING TILES (CONNECT TO EXISTING SYSTEM)
  - EW-1 EXTERIOR WALL**
    - 5/8" GYPSUM BOARD
    - 5MIL VAPOUR BARRIER
    - 6" METAL STUDS @ 16" O.C.
    - MINERAL WOOL INSULATION R20
    - 1" SHEATHING BOARD - TAPE AND SEAL
    - 1" VERTICAL P.T. WOOD STRAPPING, AIR SPACE
    - WOOD CLADDING
  - EW-2 EXTERIOR WALL @GYM**
    - 5/8" GYPSUM BOARD
    - 5MIL VAPOUR BARRIER
    - 6" METAL STUDS @ 16" O.C.
    - 4" X-BRACING
    - MINERAL WOOL INSULATION R20
    - 1" SHEATHING BOARD - TAPE AND SEAL
    - 1" VERTICAL P.T. WOOD STRAPPING, AIR SPACE
    - WOOD CLADDING
  - EW-3 EXTERIOR WALL @GYM**
    - 5/8" GYPSUM BOARD
    - 5MIL VAPOUR BARRIER
    - 4" X-BRACING CENTERED ON COLUMN
    - 6" METAL STUDS @ 16" O.C.
    - MINERAL WOOL INSULATION R20
    - 1" SHEATHING BOARD - TAPE AND SEAL
    - 1" VERTICAL P.T. WOOD STRAPPING, AIR SPACE
    - METAL CLADDING
  - IW-1 INTERIOR PARTITION 1HR FFR**
    - 5/8" GYPSUM BOARD TYPE X
    - SOUND ATTENUATION BAITS
    - 3-5/8" METAL STUDS @ 16" O.C.
    - 5/8" GYPSUM BOARD TYPE X
    - EXTEND WALL ASSEMBLY TO U/S OF EXISTING STRUCTURE
    - 1 HOUR F.R.R.
    - STC = 50
  - IW-2 INTERIOR PARTITION**
    - 5/8" GYPSUM BOARD
    - 3-5/8" METAL STUDS @ 16" O.C.
    - 5/8" GYPSUM BOARD
    - WALL ASSEMBLY TO U/S OF EXISTING CEILING
  - IW-3 INFILL INTERIOR WALL**
    - 5/8" GYPSUM BOARD
    - METAL STUDS
    - 5/8" GYPSUM BOARD
    - (BOTH FACES TO BE FLUSH WITH EXISTING WALL FACE)
  - IW-4 INTERIOR PARTITION WASHROOMS**
    - 5/8" MOISTURE RESISTANT GYPSUM BOARD ON WR SIDE
    - SOUND ATTENUATION BAITS
    - 3-5/8" METAL STUDS @ 16" O.C.
    - 5/8" GYPSUM BOARD
    - WALL ASSEMBLY TO U/S OF EXISTING CEILING
  - IW-5 STAIR WELL INTERIOR WALL**
    - 5/8" GYPSUM BOARD
    - 6" LOAD BEARING STEEL STUDS @ 16" O.C.
    - SOUND ATTENUATION BAITS
    - 4" X-BRACING
    - 5/8" GYPSUM BOARD
  - IW-1 INTERIOR WALL@FREEZER/FRIDGE**
    - INSULATED PANELS
  - IW-2 INTERIOR WALL**
    - 7 1/2" CONCRETE BLOCK WALL
  - IW-3 MECH/ELECT. SERVICES ENCLOSURE**
    - 5/8" GYPSUM BOARD
    - 2-1/2" METAL FRAMING @ 16" O.C.
    - EXTEND WALL ASSEMBLY TO U/S OF STRUCTURE
    - GYPSUM BOARD TO EXTEND 6" ABOVE ACOUSTICAL CEILING TILE

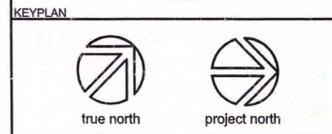
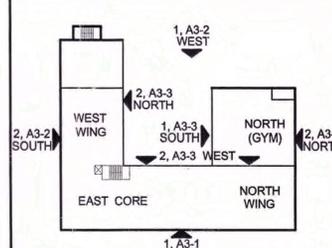
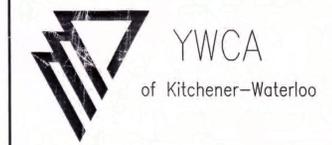
- ROOM SCHEDULE**
- (B01) MEETING ROOM
  - (B02) TRANSITIONAL UNIT 1 (BEDROOM)
  - (B02a) TRANSITIONAL UNIT 1 (KITCHEN/LIVING)
  - (B02b) TRANSITIONAL UNIT 1 (BATHROOM)
  - (B03) MECHANICAL ROOM
  - (B03a) LIFT ROOM
  - (B04) TRANSITIONAL UNIT 2 (BATHROOM)
  - (B04a) TRANSITIONAL UNIT 2 (KITCHEN/LIVING)
  - (B04b) TRANSITIONAL UNIT 2 (BEDROOM)
  - (B05) STUDENTS OFFICE
  - (B05a) COPY ROOM
  - (B06) CORRIDOR
  - (B07) STAFF ROOM
  - (B08) OFFICE
  - (B09) MAINTENANCE ROOM
  - (B10) ELEVATOR SERVICE ROOM
  - (B12) VOLUNTEER COORDINATOR AND C OF F OFFICE
  - (B13) MENS WASHROOM
  - (B14) OFFICE
  - (B15) BARRIER FREE WASHROOM
  - (B16) WOMENS WASHROOM
  - (B20) OFFICE
  - (B21) SECURITY EQUIPMENT
  - (B23) MANAGERS OFFICE
  - (B24) CORRIDOR
  - (B25) GENERAL OFFICE
  - (B26) MEETING ROOM
  - (B27) MECHANICAL ROOM
  - (B28a) ELECTRICAL ROOM
  - (B28b) ELECTRICAL ROOM
  - (B29) WASHROOM
  - (B30) NURSE STATION
  - (B31) TRANSITIONAL UNIT 3 (WASHROOM)
  - (B31a) TRANSITIONAL UNIT 3 (KITCHEN)
  - (B31b) TRANSITIONAL UNIT 3 (LIVING ROOM)
  - (B31c) TRANSITIONAL UNIT 3 (BEDROOM)
  - (B32) CORRIDOR
  - (B33a) STORAGE
  - (B33b) STORAGE
  - (B34) STORAGE
  - (B35) SHOWER ROOM
  - (B36) WASHROOM
  - (B37) UNASSIGNED
  - (G01) EXIT STAIR
  - (G02) EXIT STAIR
  - (G03) EXIT STAIR
  - (G04) EXIT STAIR
  - (G05) COMMUNICATION STAFF

**GENERAL NOTES:**

1. FOR REMOVAL OF REDUNDANT MECHANICAL/ELECTRICAL SERVICES REFER TO MECHANICAL AND ELECTRICAL DRAWINGS FOR SCOPE OF WORK. PATCH AND MAKE GOOD ALL EXISTING SURFACES TO REMAIN. PREPARE FLOORS, WALLS, AND CEILINGS TO RECEIVE NEW FINISHES. PREP AND PAINT (IF NOT NOTED BY FINISHES LEGEND).
2. RESERVED
3. DETAILS OF ALL NEW RESIDENT BATHROOMS FOLLOW DESCRIPTIONS ON A7-1. DIMENSION SPECIFICS TO EACH CONDITION TO BE COORDINATED BY CONTRACTOR.
4. CONTRACTOR TO VERIFY ALL DIMENSIONS ON SITE AND MAKE MODIFICATIONS TO SUIT EXISTING SITE CONDITIONS.
5. ALL INTERIOR WALLS, GYPSUM AND PLASTER CEILINGS TO BE PREPARED TO RECEIVE PAINT FINISH. PATCH AND MAKE GOOD DAMAGED WALLS AND PLASTER CEILINGS (EXCEPT WHERE OTHERWISE NOTED).
6. GYPSUMBOARD TIE-INS TO NEW WINDOW FROM EXISTING INTERIOR GYPSUMBOARD/INSULATION. TIE IN A/V BARRIER WITH FLEXIBLE MEMBRANE FLASHING (TYPICAL).

- 1 FLUSH WITH EXISTING WALL FACE
- 2 WINDOW IN NEW OPENING
- 3 NO WORK BEING DONE IN THIS AREA
- 4 CONCRETE INFILL OF EXISTING BASEMENT WALL (REMOVE FINISHES AND EXISTING INFILL WHERE REQUIRED). REFER TO STRUCTURAL DRAWINGS.
- 5 SALVAGED WOOD FLOORING ON KRAFT PAPER ON MIN. 3/4" PLYWOOD SUBSTRATE. NEW FLOORING TO BE FLUSH WITH EXISTING. REFINISH.
- 6 WALL TO BE FURRED OUT (TO BE FLUSH WITH EXISTING WALL FACE).
- 7 ROLL DOWN SHUTTER
- 8 NEW PARTITION TO MATCH EXISTING
- 9 SLOP SINK
- 10 WINDOW LOUVER ON METAL CLIPS
- 11 INSTALL 5/8" GYPSUM BOARD ON EXISTING WALL ASSEMBLY WITH PAINT FINISH
- 12 INFILL CONCRETE FLOORING, MAKE FLUSH WITH EXISTING
- 13 WEEPING TILE TO CONNECT TO EXISTING
- 14 PATCH CONCRETE CURB TO MATCH EXISTING.
- 15 SUMP PUMP
- 16 FILL IN FLOOR STRUCTURE
- 17 2 LAYERS OF 5/8" GYPSUM BOARD TYPE X ON EXISTING WALL ASSEMBLY. MAKE FLUSH. PROVIDE 1HR F.R.R.
- 18 AREA WELL- REFER TO STRUCTURAL DRAWINGS
- 19 ELECTRICAL PANEL (REFER TO ELECTRICAL DRAWINGS)
- 20 PROVIDE NEW FINISHED CONCRETE STEP
- 21 5/8" MOISTURE RESISTANT GYPSUMBOARD PAINTED

- FINISHES NOTES:**
- (F1) CARPET
  - (F2) SHEET/RESILIENT FLOORING
  - (F3) CERAMIC TILE
  - (F4) SAFETY FLOORING
  - (F5) SALVAGED WOOD FLOORING, REFINISHED
  - (F6) EXISTING TO REMAIN
  - (B1) RUBBER BASE
  - (B2) WOOD BASE
  - (B3) CERAMIC BASE
  - (B4) EXISTING TO REMAIN
  - (C1) GYPSUM BOARD CEILING
  - (C2) SUSPENDED CEILING
  - (C3) EXISTING TO REMAIN
  - (W1) PAINTED
  - (W2) CERAMIC TILE
  - (W3) UNFINISHED
  - (R1) EXISTING TO REMAIN



FEB 28/06 ISSUED FOR BUILDING PERMIT  
 FEB 03/06 ISSUED FOR SITE PLAN APPROVAL

customer  
**YWCA**  
 84 FREDERICK STREET  
 KITCHENER, ONTARIO

project  
**YWCA RENEWAL**  
 845 FREDERICK STREET  
 KITCHENER, ONTARIO

title  
**BASEMENT FLOOR PLAN**



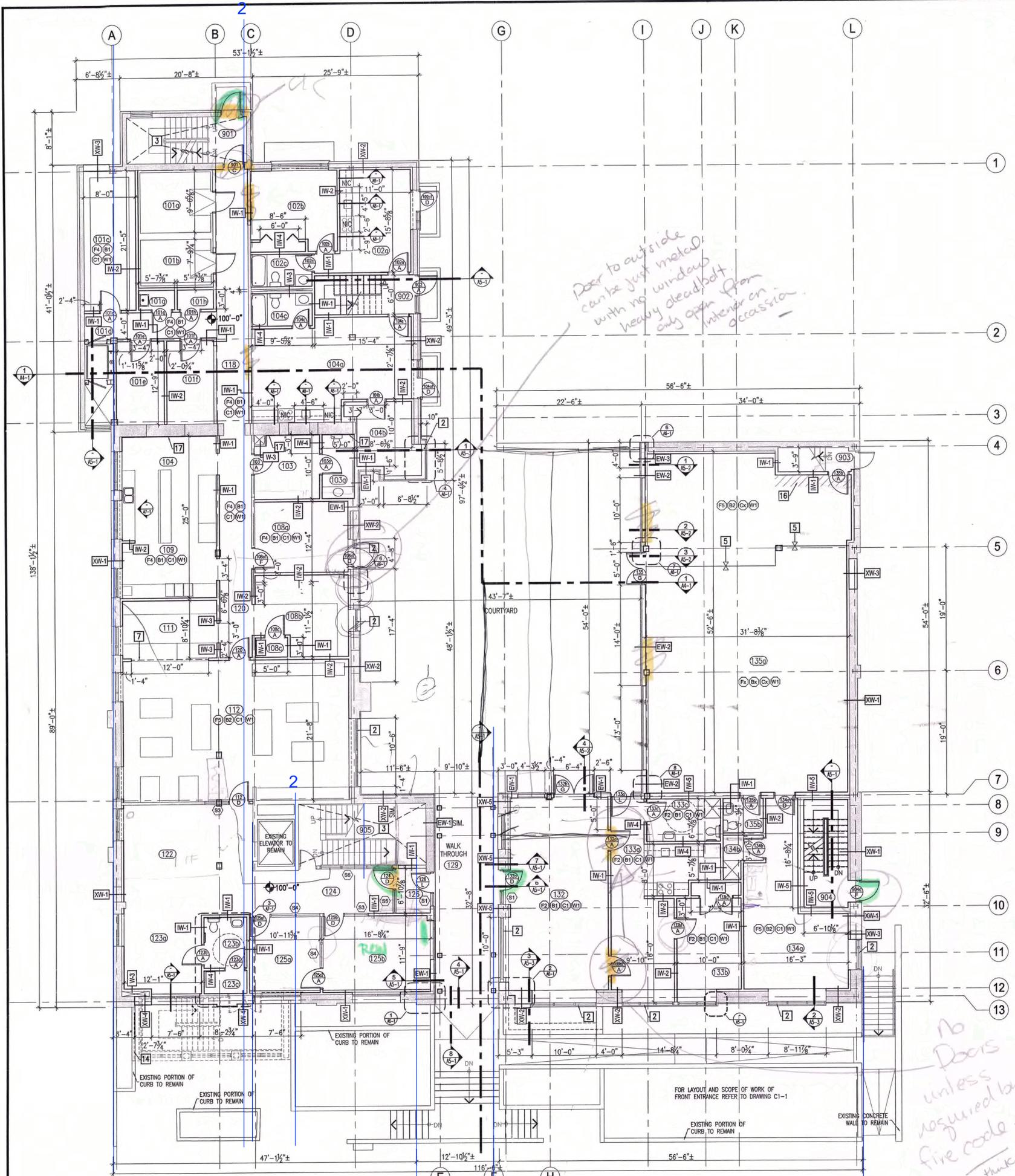
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 date: FEB 28/06  
 job no.: 2004-0433-10  
 CAD file: A2-1\_2004043310  
 drawn by: SR, JEM  
 checked by:

**A2-1**



*Door to outside can be just made with no windows with heavy deadbolt only open from interior on occasion.*

*please make sure door to interior is controlled entrance*

*please have a washroom if possible - use existing for children please add wall obviously if necessary*

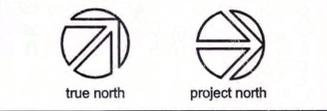
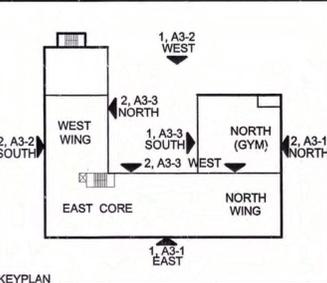
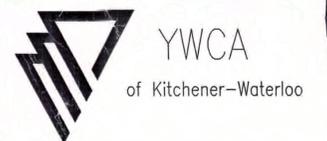
*No Doors unless required by fire code.*

**WALL TYPE LEGEND**

- EXISTING WALL ASSEMBLY**
- XW-1 EXTERIOR WALL INSULATION**
  - 5/8" GYPSUM BOARD
  - VAPOUR BARRIER (TAPE AND SEAL ALL JOINTS)
  - MINERAL WOOL INSULATION R13.5
  - 3-5/8" METAL STUDS @ 16" O.C.
  - AIR BARRIER
  - EXISTING WALL ASSEMBLY
- XW-2 EXISTING EXTERIOR WALL WOOD CLADDING**
  - 5/8" GYPSUM BOARD
  - VAPOUR BARRIER (TAPE AND SEAL ALL JOINTS)
  - MINERAL WOOL INSULATION R13.5
  - 3-5/8" METAL STUDS @ 16" O.C.
  - AIR BARRIER
  - EXISTING WALL ASSEMBLY
  - MOISTURE BARRIER
  - 1" VERTICAL WOOD STRAPPING @ 16" O.C.
  - WOOD CLADDING, TONGUE AND GROOVE
- XW-3 EXISTING EXTERIOR WALL INFILL**
  - GYPSUM BOARD (TO BE FLUSH WITH EXISTING WALL FACE)
  - METAL STUDS
  - 5-1/2" CONCRETE BLOCK
  - SALVAGED BRICK (TOOTHIN FLUSH WITH EXISTING WALL FACE)
- XW-4 EXISTING EXTERIOR WALL INFILLS**
  - (OVERALL WALL WIDTH TO MATCH EXISTING)
  - 5/8" GYPSUM BOARD (TO BE FLUSH WITH EXISTING WALL FACE)
  - VAPOUR BARRIER (TAPE AND SEAL ALL JOINTS)
  - MINERAL WOOL INSULATION R13.5
  - METAL STUDS @ 16" O.C.
  - AIR BARRIER
  - 1" AIRSPACE
  - SALVAGED BRICK (TOOTHIN-FLUSH WITH EXISTING WALL FACE)
- XW-5 EXISTING EXTERIOR WALL CERAMIC TILE CLADDING**
  - 5/8" GYPSUM BOARD
  - VAPOUR BARRIER (TAPE AND SEAL ALL JOINTS)
  - MINERAL WOOL INSULATION R13.5
  - 3-5/8" METAL STUDS @ 16" O.C.
  - AIR BARRIER
  - EXISTING WALL ASSEMBLY
  - 1" METAL FURRING CHANNEL @ 16" O.C. (MECHANICALLY FASTENED)
  - 1/2" CEMENT BOARD
  - THIN SET EPOXY MORTAR BED
  - PORCELAIN TILE
- XB-1 EXISTING BASEMENT WALL**
  - 5/8" GYPSUM BOARD
  - VAPOUR BARRIER (TAPE AND SEAL ALL JOINTS)
  - MINERAL WOOL INSULATION R13.5
  - 3-5/8" METAL STUDS @ 16" O.C.
  - AIR BARRIER
  - EXISTING WALL ASSEMBLY
  - WATERPROOFING
  - 2" RIGID INSULATION, FULL HEIGHT
  - DRAINAGE BOARD
  - WEAVING TILES (CONNECT TO EXISTING SYSTEM WHERE EXCAVATED)
- EB-1 BASEMENT WALL**
  - REINFORCED POURED CONCRETE (REFER TO STRUCTURAL DRAWINGS)
  - WATERPROOFING MEMBRANE
  - 2" RIGID INSULATION, FULL HEIGHT
  - DRAINAGE BOARD
  - WEAVING TILES (CONNECT TO EXISTING SYSTEM)
- EB-2 BASEMENT WALL FINISHED INTERIOR**
  - 5/8" GYPSUM BOARD
  - VAPOUR BARRIER (TAPE AND SEAL ALL JOINTS)
  - MINERAL WOOL INSULATION R13.5
  - 3-5/8" METAL STUDS @ 16" O.C.
  - AIR BARRIER
  - REINFORCED POURED CONCRETE (REFER TO STRUCTURAL DRAWINGS)
  - WATERPROOFING MEMBRANE
  - 2" RIGID INSULATION, FULL HEIGHT
  - DRAINAGE BOARD
  - WEAVING TILES (CONNECT TO EXISTING SYSTEM)
- EW-1 EXTERIOR WALL**
  - 5/8" GYPSUM BOARD
  - 6MIL VAPOUR BARRIER
  - 6" METAL STUDS @ 16" O.C.
  - MINERAL WOOL INSULATION R20
  - 1" SHEATHING BOARD - TAPE AND SEAL
  - 1" VERTICAL P.T. WOOD STRAPPING, AIR SPACE
  - WOOD CLADDING
- EW-2 EXTERIOR WALL @ GYM**
  - 5/8" GYPSUM BOARD
  - 6MIL VAPOUR BARRIER
  - 6" METAL STUDS @ 16" O.C.
  - 4" X-BRACING
  - MINERAL WOOL INSULATION R20
  - 1" SHEATHING BOARD - TAPE AND SEAL
  - 1" VERTICAL P.T. WOOD STRAPPING, AIR SPACE
  - WOOD CLADDING
- EW-3 EXTERIOR WALL @ GYM**
  - 5/8" GYPSUM BOARD
  - 6MIL VAPOUR BARRIER
  - 4" X-BRACING CENTERED ON COLUMN
  - 6" METAL STUDS @ 16" O.C.
  - MINERAL WOOL INSULATION R20
  - 1" SHEATHING BOARD - TAPE AND SEAL
  - 1" VERTICAL P.T. WOOD STRAPPING, AIR SPACE
  - METAL CLADDING
- IW-1 INTERIOR PARTITION 1HR FFR**
  - 5/8" GYPSUM BOARD TYPE X
  - SOUND ATTENUATION BATTIS
  - 3-5/8" METAL STUDS @ 16" O.C.
  - 5/8" GYPSUM BOARD TYPE X
  - EXTEND WALL ASSEMBLY TO U/S OF EXISTING STRUCTURE
  - 1 HOUR F.R.R.
  - STC = 50
- IW-2 INTERIOR PARTITION**
  - 5/8" GYPSUM BOARD
  - 3-5/8" METAL STUDS @ 16" O.C.
  - 5/8" GYPSUM BOARD
  - WALL ASSEMBLY TO U/S OF EXISTING CEILING
- IW-3 INFILL INTERIOR WALL**
  - 5/8" GYPSUM BOARD
  - METAL STUDS
  - 5/8" GYPSUM BOARD
  - (BOTH FACES TO BE FLUSH WITH EXISTING WALL FACE)
- IW-4 INTERIOR PARTITION WASHROOMS**
  - 5/8" MOISTURE RESISTANT GYPSUM BOARD ON WR SIDE
  - SOUND ATTENUATION BATTIS
  - 3-5/8" METAL STUDS @ 16" O.C.
  - 5/8" GYPSUM BOARD
  - WALL ASSEMBLY TO U/S OF EXISTING CEILING
- IW-5 STAIR WELL INTERIOR WALL**
  - 5/8" GYPSUM BOARD
  - 6" LOAD BEARING STEEL STUDS @ 16" O.C.
  - SOUND ATTENUATION BATTIS
  - 4" X-BRACING
  - 5/8" GYPSUM BOARD
- IW-1 INTERIOR WALL @ FREEZER/FRIDGE**
  - INSULATED PANELS
- IW-2 INTERIOR WALL**
  - 7 1/2" CONCRETE BLOCK WALL
- IW-3 MECH/ELECT. SERVICES ENCLOSURE**
  - 5/8" GYPSUM BOARD
  - 2-1/2" METAL FRAMING @ 16" O.C.
  - EXTEND WALL ASSEMBLY TO U/S OF STRUCTURE
  - SOUND ATTENUATION BATTIS
  - 4" X-BRACING
  - 5/8" GYPSUM BOARD

**ROOM SCHEDULE**

- (101) FREEZER
- (101b) FRIDGE
- (101c) DRY STORAGE
- (101d) CORRIDOR
- (101e) GARBAGE
- (101f) RECYCLING
- (101g) JANITOR
- (101h) ELECTRICAL
- (102) TRANSITIONAL UNIT 4(LIVING/DINING)
- (102b) TRANSITIONAL UNIT 4(BEDROOM)
- (102c) TRANSITIONAL UNIT 4(BATHROOM)
- (103) STAFF LOCKER ROOM
- (103a) STAFF WR ROOM
- (104) KITCHEN PREP
- (104b) KITCHEN OFFICE
- (108b) DISHWASHING
- (108c) FURNACE ROOM
- (109) KITCHEN
- (111) SERVEY
- (112) DINING ROOM
- (120) CORRIDOR
- (122) LOUNGE/COMPUTERS/LIBRARY
- (123) TELEPHONE
- (123b) WASHROOM
- (123c) FURNACE ROOM
- (124) CORRIDOR
- (125) INTERVIEW ROOM
- (125b) RCW ROOM
- (126) VESTIBULE
- (129) COVERED WALK-THRU
- (132) VISITOR'S LOUNGE
- (133a) BARRIER FREE UNIT 6(LIVING ROOM)
- (133b) BARRIER FREE UNIT 6(BEDROOM)
- (133c) BARRIER FREE UNIT 6(BATHROOM)
- (134) RECREATION ROOM
- (134b) JANITOR
- (135) DOUBLE HEIGHT GYM
- (135b) WASHROOM
- (901) EXIT STAIR
- (902) EXIT STAIR
- (903) EXIT STAIR
- (904) EXIT STAIR
- (905) EXIT STAIR



- GENERAL NOTES:**
1. FOR REMOVAL OF REDUNDANT MECHANICAL/ELECTRICAL SERVICES REFER TO MECHANICAL AND ELECTRICAL DRAWINGS FOR SCOPE OF WORK. PATCH AND MAKE GOOD ALL EXISTING SURFACES TO REMAIN. PREPARE FLOORS, WALLS, AND CEILINGS TO RECEIVE NEW FINISHES. PREP AND PAINT (IF NOT NOTED BY FINISHES LEGEND)
  2. RESERVED
  3. DETAILS OF ALL NEW RESIDENT BATHROOMS FOLLOW DESCRIPTIONS ON A7-1. DIMENSION SPECIFICS TO EACH CONDITION TO BE COORDINATED BY CONTRACTOR.
  4. CONTRACTOR TO VERIFY ALL DIMENSIONS ON SITE AND MAKE MODIFICATIONS TO SUIT EXISTING SITE CONDITIONS.
  5. ALL INTERIOR WALLS, GYPSUM AND PLASTER CEILINGS TO BE PREPARED TO RECEIVE PAINT FINISH. PATCH AND MAKE GOOD DAMAGED WALLS AND PLASTER CEILINGS (EXCEPT WHERE OTHERWISE NOTED).
  6. GYPSUMBOARD TIE-INS TO NEW WINDOW FROM EXISTING INTERIOR GYPSUMBOARD/INSULATION. TIE IN A/V BARRIER WITH FLEXIBLE MEMBRANE FLASHING (TYPICAL).
- 1 FLUSH WITH EXISTING WALL FACE
  - 2 WINDOW IN NEW OPENING
  - 3 NO WORK BEING DONE IN THIS AREA
  - 4 CONCRETE INFILL OF EXISTING BASEMENT WALL (REMOVE FINISHES AND EXISTING INFILL WHERE REQUIRED). REFER TO STRUCTURAL DRAWINGS.
  - 5 SALVAGED WOOD FLOORING ON KRAFT PAPER ON MIN. 3/4" PLYWOOD SUBSTRATE. NEW FLOORING TO BE FLUSH WITH EXISTING. REFINISH.
  - 6 WALL TO BE FURRED OUT (TO BE FLUSH WITH EXISTING WALL FACE).
  - 7 ROLL DOWN SHUTTER
  - 8 NEW PARTITION TO MATCH EXISTING
  - 9 SLOP SINK
  - 10 WOOD LOUVER ON METAL CLIPS
  - 11 INSTALL 5/8" GYPSUM BOARD ON EXISTING WALL ASSEMBLY WITH PAINT FINISH
  - 12 INFILL CONCRETE FLOORING, MAKE FLUSH WITH EXISTING
  - 13 WEAVING TILE TO CONNECT TO EXISTING
  - 14 PATCH CONCRETE CURB TO MATCH EXISTING.
  - 15 SUMP PUMP
  - 16 FILL IN FLOOR STRUCTURE
  - 17 2 LAYERS OF 5/8" GYPSUM BOARD TYPE X ON EXISTING WALL ASSEMBLY. MAKE FLUSH. PROVIDE 1HR F.R.R.
  - 18 AREA WELL- REFER TO STRUCTURAL DRAWINGS
  - 19 ELECTRICAL PANEL (REFER TO ELECTRICAL DRAWINGS)
  - 20 PROVIDE NEW FINISHED CONCRETE STEP
  - 21 5/8" MOISTURE RESISTANT GYPSUMBOARD PAINTED

- FINISHES NOTES:**
- (1) CARPET
  - (2) SHEET/RESILIENT FLOORING
  - (3) CERAMIC TILE
  - (4) SAFETY FLOORING
  - (5) SALVAGED WOOD FLOORING, REFINISHED
  - (6) EXISTING TO REMAIN
  - (8) RUBBER BASE
  - (9) WOOD BASE
  - (10) CERAMIC BASE
  - (11) EXISTING TO REMAIN
  - (12) GYPSUM BOARD CEILING
  - (13) SUSPENDED CEILING
  - (14) EXISTING TO REMAIN
  - (15) PAINTED
  - (16) CERAMIC TILE
  - (17) UNFINISHED
  - (18) EXISTING TO REMAIN

FEB 28/06 ISSUED FOR BUILDING PERMIT  
 FEB 03/06 ISSUED FOR SITE PLAN APPROVAL  
 date revisions

**YWCA**  
 84 FREDERICK STREET  
 KITCHENER, ONTARIO

**project**  
 YWCA RENEWAL  
 84 FREDERICK STREET  
 KITCHENER, ONTARIO

**title**  
 GROUND FLOOR PLAN

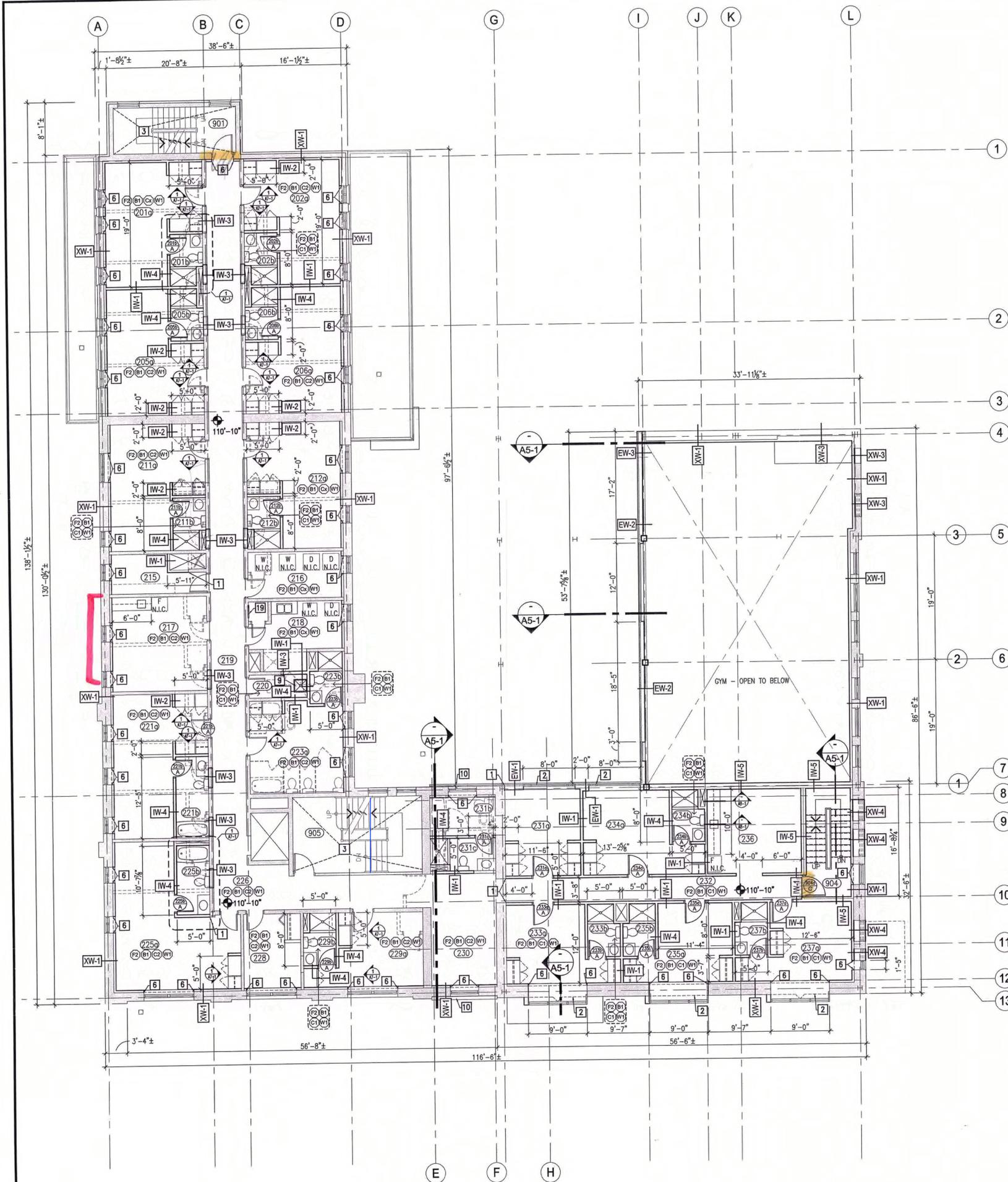
**THE walterfedy PARTNERSHIP**  
 ARCHITECTS • ENGINEERS  
 546 Belmont Ave. W., Kitchener, Ontario, N2M 5E3  
 P: 519-576-2150 F: 519-576-5499 www.wfep.com

The contractor shall check and verify all dimensions and report any errors or omissions to the consultant before commencing or proceeding with any work. Do not scale this drawing.

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 scale: 1/8"=1'-0"  
 date: FEB 15/06  
 job no.: 2004-0433-10  
 CAD file: A2-2\_2004043310  
 drawn by: SR,JE,MB

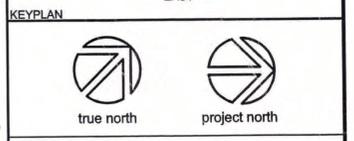
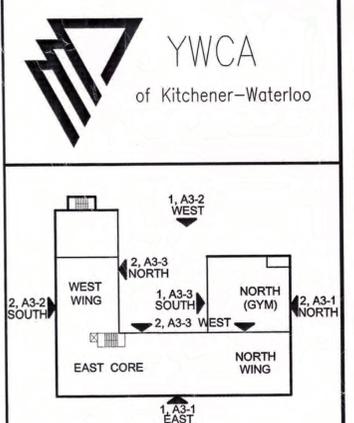


**A2-2**



- WALL TYPE LEGEND**
- EXISTING WALL ASSEMBLY**
  - XW-1 EXTERIOR WALL INSULATION**  
-5/8" GYPSUM BOARD  
-VAPOUR BARRIER (TAPE AND SEAL ALL JOINTS)  
-MINERAL WOOL INSULATION R13.5  
-3-5/8" METAL STUDS @ 16" O.C.  
-AIR BARRIER  
-EXISTING WALL ASSEMBLY
  - XW-2 EXISTING EXTERIOR WALL WOOD CLADDING**  
-5/8" GYPSUM BOARD  
-VAPOUR BARRIER (TAPE AND SEAL ALL JOINTS)  
-MINERAL WOOL INSULATION R13.5  
-3-5/8" METAL STUDS @ 16" O.C.  
-AIR BARRIER  
-EXISTING WALL ASSEMBLY  
-MOISTURE BARRIER  
-1" VERTICAL WOOD STRAPPING @ 16" O.C.  
-WOOD CLADDING, TONGUE AND GROOVE
  - XW-3 EXISTING EXTERIOR WALL INFILL 1**  
-GYPSUM BOARD (TO BE FLUSH WITH EXISTING WALL FACE)  
-METAL STUDS  
-5-1/2" CONCRETE BLOCK  
-SALVAGED BRICK (TOOTHIN FLUSH WITH EXISTING WALL FACE)
  - XW-4 EXISTING EXTERIOR WALL INFILL 2**  
(OVERALL WALL WIDTH TO MATCH EXISTING)  
-5/8" GYPSUM BOARD (TO BE FLUSH WITH EXISTING WALL FACE)  
-VAPOUR BARRIER (TAPE AND SEAL ALL JOINTS)  
-MINERAL WOOL INSULATION R13.5  
-METAL STUDS @ 16" O.C.  
-AIR BARRIER  
-1" AIRSPACE  
-SALVAGED BRICK (TOOTHIN-FLUSH WITH EXISTING WALL FACE)
  - XW-5 EXISTING EXTERIOR WALL CERAMIC TILE CLADDING**  
-5/8" GYPSUM BOARD  
-VAPOUR BARRIER (TAPE AND SEAL ALL JOINTS)  
-MINERAL WOOL INSULATION R13.5  
-3-5/8" METAL STUDS @ 16" O.C.  
-AIR BARRIER  
-EXISTING WALL ASSEMBLY  
-1" METAL FURRING CHANNEL @ 16" O.C. (MECHANICALLY FASTENED)  
-1/2" CEMENT BOARD  
-THIN SET EPOXY MORTAR BED  
-PORCELAIN TILE
  - XB-1 EXISTING BASEMENT WALL**  
-5/8" GYPSUM BOARD  
-VAPOUR BARRIER (TAPE AND SEAL ALL JOINTS)  
-MINERAL WOOL INSULATION R13.5  
-3-5/8" METAL STUDS @ 16" O.C.  
-AIR BARRIER  
-EXISTING WALL ASSEMBLY  
-WATERPROOFING  
-2" RIGID INSULATION, FULL HEIGHT  
-DRAINAGE BOARD  
-WEEPING TILES (CONNECT TO EXISTING SYSTEM WHERE EXCAVATED)
  - EB-1 BASEMENT WALL**  
-REINFORCED POURED CONCRETE (REFER TO STRUCTURAL DRAWINGS)  
-WATERPROOFING MEMBRANE  
-2" RIGID INSULATION, FULL HEIGHT  
-DRAINAGE BOARD  
-WEEPING TILES (CONNECT TO EXISTING SYSTEM)
  - EB-2 BASEMENT WALL FINISHED INTERIOR**  
-5/8" GYPSUM BOARD  
-VAPOUR BARRIER (TAPE AND SEAL ALL JOINTS)  
-MINERAL WOOL INSULATION R13.5  
-3-5/8" METAL STUDS @ 16" O.C.  
-AIR BARRIER  
-REINFORCED POURED CONCRETE (REFER TO STRUCTURAL DRAWINGS)  
-WATERPROOFING MEMBRANE  
-2" RIGID INSULATION, FULL HEIGHT  
-DRAINAGE BOARD  
-WEEPING TILES (CONNECT TO EXISTING SYSTEM)
  - EW-1 EXTERIOR WALL**  
-5/8" GYPSUM BOARD  
-6MIL VAPOUR BARRIER  
-6" METAL STUDS @ 16" O.C.  
-MINERAL WOOL INSULATION R20  
-1" SHEATHING BOARD - TAPE AND SEAL  
-1" VERTICAL P.T. WOOD STRAPPING, AIR SPACE  
-WOOD CLADDING
  - EW-2 EXTERIOR WALL @ GYM**  
-5/8" GYPSUM BOARD  
-6MIL VAPOUR BARRIER  
-6" METAL STUDS @ 16" O.C.  
-4" X-BRACING  
-MINERAL WOOL INSULATION R20  
-1" SHEATHING BOARD - TAPE AND SEAL  
-1" VERTICAL P.T. WOOD STRAPPING, AIR SPACE  
-WOOD CLADDING
  - EW-3 EXTERIOR WALL @ GYM**  
-5/8" GYPSUM BOARD  
-6MIL VAPOUR BARRIER  
-4" X-BRACING CENTERED ON COLUMN  
-6" METAL STUDS @ 16" O.C.  
-MINERAL WOOL INSULATION R20  
-1" SHEATHING BOARD - TAPE AND SEAL  
-1" VERTICAL P.T. WOOD STRAPPING, AIR SPACE  
-METAL CLADDING
  - IW-1 INTERIOR PARTITION 1HR FFR**  
-5/8" GYPSUM BOARD TYPE X  
-SOUND ATTENUATION BATTS  
-3-5/8" METAL STUDS @ 16" O.C.  
-5/8" GYPSUM BOARD TYPE X  
-EXTEND WALL ASSEMBLY TO U/S OF EXISTING STRUCTURE  
-1 HOUR F.R.R.  
-STC = 50
  - IW-2 INTERIOR PARTITION**  
-5/8" GYPSUM BOARD  
-3-5/8" METAL STUDS @ 16" O.C.  
-5/8" GYPSUM BOARD  
-WALL ASSEMBLY TO U/S OF EXISTING CEILING
  - IW-3 INFILL INTERIOR WALL**  
-5/8" GYPSUM BOARD  
-METAL STUDS  
-5/8" GYPSUM BOARD  
(BOTH FACES TO BE FLUSH WITH EXISTING WALL FACE)
  - IW-4 INTERIOR PARTITION WASHROOMS**  
-5/8" MOISTURE RESISTANT GYPSUM BOARD ON WR SIDE  
-SOUND ATTENUATION BATTS  
-3-5/8" METAL STUDS @ 16" O.C.  
-5/8" GYPSUM BOARD  
-WALL ASSEMBLY TO U/S OF EXISTING CEILING
  - IW-5 STAIR WELL INTERIOR WALL**  
-5/8" GYPSUM BOARD  
-6" LOAD BEARING STEEL STUDS @ 16" O.C.  
-SOUND ATTENUATION BATTS  
-4" X-BRACING  
-5/8" GYPSUM BOARD
  - W-1 INTERIOR WALL @ FREEZER/FRIDGE**  
-INSULATED PANELS
  - W-2 INTERIOR WALL**  
-7 1/2" CONCRETE BLOCK WALL
  - W-3 MECH/ELECT. SERVICES ENCLOSURE**  
-5/8" GYPSUM BOARD  
-2-1/2" METAL FRAMING @ 16" O.C.  
-EXTEND WALL ASSEMBLY TO U/S OF STRUCTURE  
-GYPSUM BOARD TO EXTEND 6" ABOVE ACOUSTICAL CEILING TILE

- ROOM LEGEND**
- 201a BEDROOM
  - 201b BATHROOM
  - 202a BEDROOM
  - 202b BATHROOM
  - 205a BEDROOM
  - 205b BATHROOM
  - 206a BEDROOM
  - 206b BATHROOM
  - 211a BEDROOM
  - 211b BATHROOM
  - 212a BEDROOM
  - 212b BATHROOM
  - 215 LINEN STORAGE
  - 216 LAUNDRY (RESIDENT)
  - 217 LOUNGE/KITCHENETTE
  - 218 LAUNDRY (STAFF)
  - 219 CORRIDOR
  - 220 JANITOR
  - 221a BEDROOM
  - 221b BATHROOM
  - 223a BEDROOM
  - 223b BATHROOM
  - 225a BEDROOM
  - 225b BATHROOM
  - 226 CORRIDOR
  - 228 QUIET ROOM
  - 229a BEDROOM
  - 229b BATHROOM
  - 230 SEATING AREA
  - 231a BEDROOM
  - 231b BATHROOM
  - 232 CORRIDOR
  - 233a BEDROOM
  - 233b BATHROOM
  - 234a BEDROOM
  - 234b BATHROOM
  - 235a BEDROOM
  - 235b BATHROOM
  - 236 LOUNGE/KITCHENETTE
  - 237a BEDROOM
  - 237b BATHROOM
  - 901 EXIT STAIR
  - 904 EXIT STAIR
  - 905 EXIT STAIR
- Question: Are their still built in desks / dressers in each unit? or was it cut because of architect & don't understand everything so while it may seem basic, sorry for asking.*



- GENERAL NOTES:**
- FOR REMOVAL OF REDUNDANT MECHANICAL/ELECTRICAL SERVICES REFER TO MECHANICAL AND ELECTRICAL DRAWINGS FOR SCOPE OF WORK. PATCH AND MAKE GOOD ALL EXISTING SURFACES TO REMAIN. PREPARE FLOORS, WALLS, AND CEILINGS TO RECEIVE NEW FINISHES. PREP AND PAINT (IF NOT NOTED BY FINISHES LEGEND)
  - RESERVED
  - DETAILS OF ALL NEW RESIDENT BATHROOMS FOLLOW DESCRIPTIONS ON A7-1. DIMENSION SPECIFICS TO EACH CONDITION TO BE COORDINATED BY CONTRACTOR.
  - CONTRACTOR TO VERIFY ALL DIMENSIONS ON SITE AND MAKE MODIFICATIONS TO SUIT EXISTING SITE CONDITIONS.
  - ALL INTERIOR WALLS, GYPSUM AND PLASTER CEILINGS TO BE PREPARED TO RECEIVE PAINT FINISH. PATCH AND MAKE GOOD DAMAGED WALLS AND PLASTER CEILINGS (EXCEPT WHERE OTHERWISE NOTED).
  - GYPSUMBOARD TIE-INS TO NEW WINDOW FROM EXISTING INTERIOR GYPSUMBOARD/INSULATION. TIE IN A/V BARRIER WITH FLEXIBLE MEMBRANE FLASHING (TYPICAL).
- FLUSH WITH EXISTING WALL FACE
  - WINDOW IN NEW OPENING
  - NO WORK BEING DONE IN THIS AREA
  - CONCRETE INFILL OF EXISTING BASEMENT WALL (REMOVE FINISHES AND EXISTING INFILL WHERE REQUIRED). REFER TO STRUCTURAL DRAWINGS.
  - SALVAGED WOOD FLOORING ON KRAFT PAPER ON MIN. 3/4" PLYWOOD SUBSTRATE. NEW FLOORING TO BE FLUSH WITH EXISTING. REFINISH.
  - WALL TO BE FURRED OUT (TO BE FLUSH WITH EXISTING WALL FACE).
  - ROLL DOWN SHUTTER
  - NEW PARTITION TO MATCH EXISTING
  - SLOP SINK
  - WOOD LOUVER ON METAL CLIPS
  - INSTALL 5/8" GYPSUM BOARD ON EXISTING WALL ASSEMBLY WITH PAINT FINISH
  - INFILL CONCRETE FLOORING, MAKE FLUSH WITH EXISTING
  - WEEPING TILE TO CONNECT TO EXISTING
  - PATCH CONCRETE CURB TO MATCH EXISTING.
  - SUMP PUMP
  - FILL IN FLOOR STRUCTURE
  - 2 LAYERS OF 5/8" GYPSUM BOARD TYPE X ON EXISTING WALL ASSEMBLY. MAKE FLUSH. PROVIDE 1HR F.R.R.
  - AREA WELL - REFER TO STRUCTURAL DRAWINGS
  - ELECTRICAL PANEL (REFER TO ELECTRICAL DRAWINGS)
  - PROVIDE NEW FINISHED CONCRETE STEP
  - 5/8" MOISTURE RESISTANT GYPSUMBOARD PAINTED

FEB 28/06 ISSUED FOR BUILDING PERMIT  
 FEB 03/06 ISSUED FOR SITE PLAN APPROVAL  
 date  
 customer  
 YWCA  
 84 FREDERICK STREET  
 KITCHENER, ONTARIO  
 project  
 YWCA RENEWAL  
 84 FREDERICK STREET  
 KITCHENER, ONTARIO  
 title  
 SECOND FLOOR PLAN

**THE walterfedy PARTNERSHIP**  
 ARCHITECTS • ENGINEERS  
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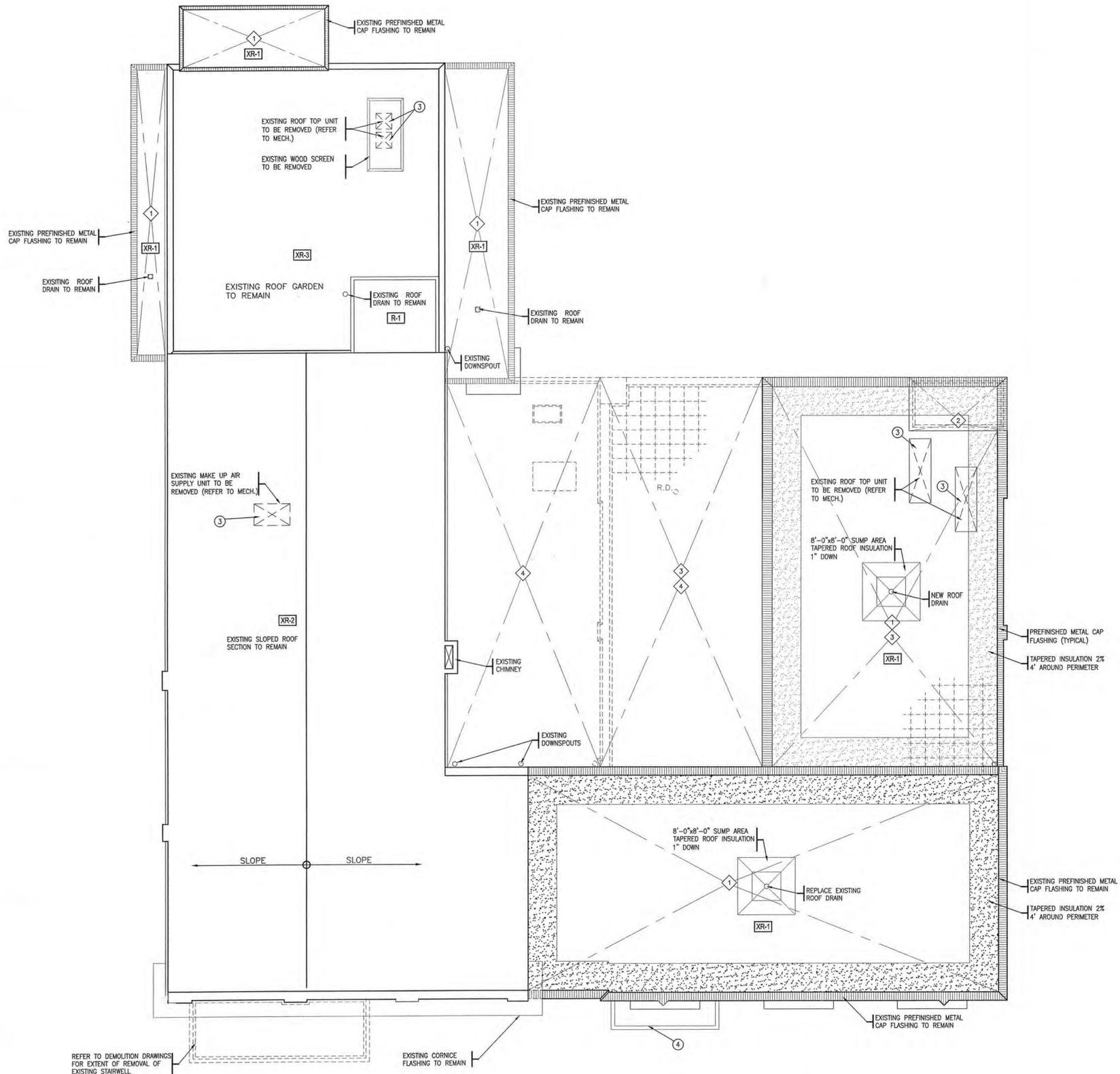
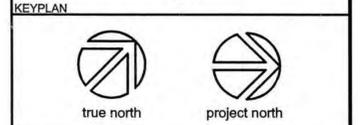
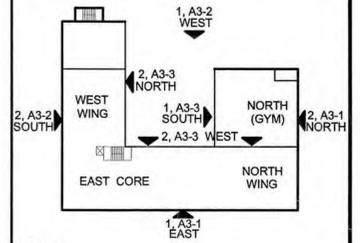
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 job no.: 2004-0433-10  
 CAD file: A2-3\_2004043310  
 drawn by: SR, JEM  
 checked by:

BCIN:  
 sheet no.:  
**A2-3**

ONTARIO ASSOCIATION OF ARCHITECTS  
 OF ARCHITECTS  
 ROGER J. FARWELL  
 LICENSEE  
 3161





**GENERAL NOTES**

1. ALL EXISTING ROOF TOP UNITS, VENTS, EXHAUST FANS, ETC. ARE SHOWN IN THEIR APPROXIMATE LOCATIONS. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS ON SITE AND SHALL REPORT ANY DISCREPANCIES TO THE CONSULTANT BEFORE COMMENCING WORK.
2. CONTRACTOR TO VERIFY ALL DIMENSIONS ON SITE AND MAKE MODIFICATIONS TO SUIT EXISTING SITE CONDITIONS.

**CONSTRUCTION NOTES**

- 1 REMOVE EXISTING EXHAUST HOOD ASSEMBLY FROM TOP OF EXISTING ROOF. REFER TO STRUCTURAL DWG'S FOR STRUCTURAL ROOF INFILL DETAILS. PROVIDE NEW ROOF ASSEMBLY. MAKE FLUSH WITH EXISTING ROOF STRUCTURE
- 2 SAW CUT AND REMOVE EXISTING MASONRY WALL FOR MECH. DUCTS. CO-ORDINATE WITH MECH. FOR EXACT SIZE OF OPENING AND LOCATION. TRIM AND SEAL AROUND DUCT PENETRATION.
- 3 INFILL EXISTING REDUNDANT MECH. ROOF OPENING'S. PROVIDE 1 1/2" METAL DECK SECURED TO EXISTING CURB. PREPARE TO RECEIVE NEW ROOF ASSEMBLY. MATCH EXISTING ROOF ASSEMBLY WHERE ROOF STAYS EXISTING.
- 4 FOR WATERPROOFING OF NEW ROOF, REFER TO SECTION DETAILS A5-1
- 5 REFER TO STRUCTURAL DRAWINGS FOR STRUCTURAL ROOF INFILL DETAILS. MAKE NEW STRUCTURE FLUSH WITH EXISTING TO RECEIVE NEW ROOF ASSEMBLY.

**DEMOLITION NOTES**

- 1 REMOVE EXISTING ROOF ASSEMBLY DOWN TO EXISTING ROOF DECK/STRUCTURE. REMOVE EXISTING METAL FLASHING, AND PARAPET ROOF MEMBRANES.
- 2 REMOVE EXISTING WALL/ROOF ASSEMBLY OF STAIRWELL DOWN TO EXISTING ROOF DECK/STRUCTURE. REFER TO BUILDING ELEVATIONS FOR HEIGHT. REMOVE EXISTING METAL FLASHING, AND PARAPET ROOF MEMBRANES.
- 3 REMOVE EXISTING CONCRETE PATIO STONES. STACK AND STORE ON SITE FOR LATER INSTALLATION IN COURTYARD ETC.
- 4 FOR EXTENT OF DEMOLITION REFER TO DEMOLITION DRAWINGS
- 5 REPLACE EVERY SECOND BRICK WITH BRICK VENT FOR VENTILATION OF ROOF. PATCH AND MAKE GOOD ALL SURFACES TO REMAIN.

**ROOF TYPE LEGEND**

- XR-1** ROOF ASSEMBLY GYM/NORTH WING
  - PVC MEMBRANE
  - 6" RIGID INSULATION R=30
  - AIR/VAPOUR BARRIER
  - EXISTING ROOF DECK/STRUCTURE
  - 1 F.R.R.
- XR-2** ROOF ASSEMBLY
  - PVC MEMBRANE
  - EXISTING WOOD DECK
  - 1" AIRSPACE
  - 10" MINERAL WOOL INSULATION R=30 (IN EXISTING ATTIC SPACE BETWEEN TRUSSES)
  - AIR/VAPOUR BARRIER
  - 1HR F.R.R.
- XR-3** ROOF ASSEMBLY ROOF GARDEN
  - EXISTING ROOF ASSEMBLY
  - MIN. 7" VENTILATED AIRSPACE
  - 10" MINERAL WOOL INSULATION R=30 (IN EXISTING ATTIC SPACE BETWEEN TRUSSES)
  - AIR/VAPOUR BARRIER
  - METAL FRAMING
  - 2 LAYERS 5/8" GYPSUM BOARD (TYPE X)
  - 1HR F.R.R.
- R-1** ROOF ASSEMBLY MECHANICAL PENTHOUSE
  - PVC MEMBRANE
  - 6" RIGID INSULATION R=30
  - AIR/VAPOUR BARRIER
  - METAL ROOF DECK

*This looks really good!*

date	revisions
FEB 28/06	ISSUED FOR BUILDING PERMIT

customer

**YWCA**  
84 FREDERICK STREET  
KITCHENER, ONTARIO

project

**YWCA RENEWAL**  
84 FREDERICK STREET  
KITCHENER, ONTARIO

title

**ROOF PLAN**



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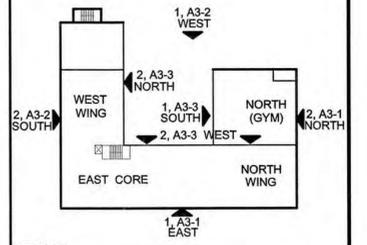
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drawn by:	JE		
checked by:			

**A2-5**



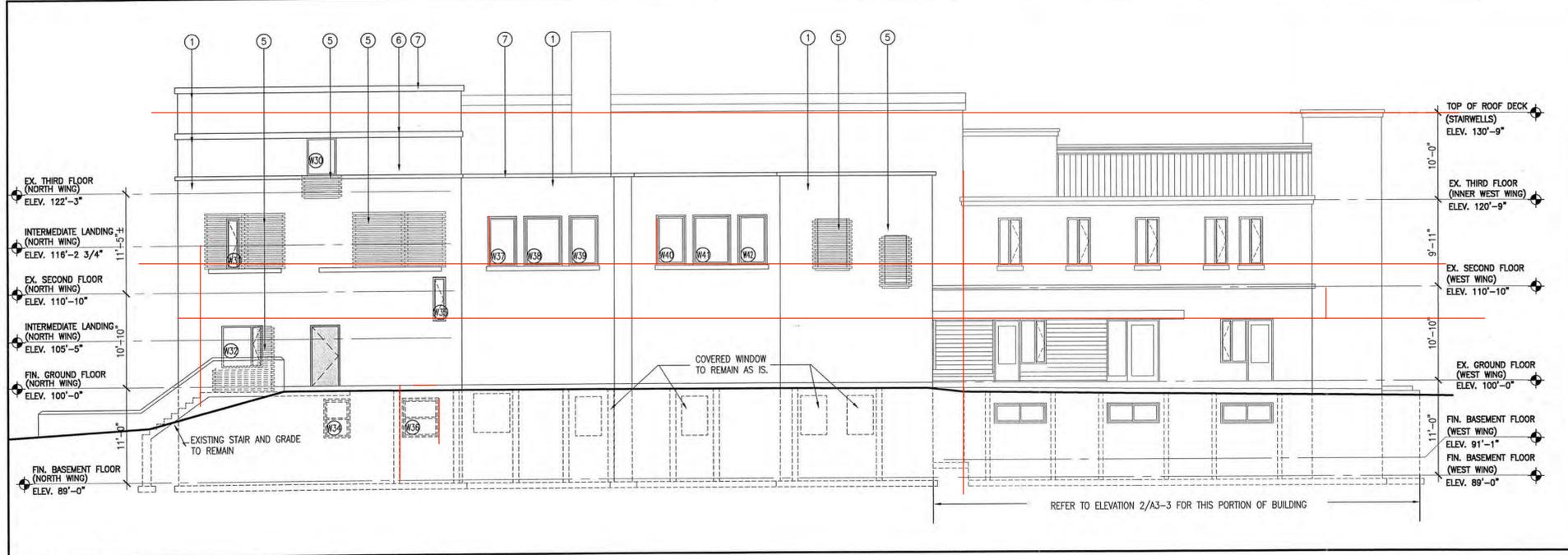
KEYPLAN

- BUILDING MATERIALS:**
- 1 EXISTING BRICK VENEER
  - 2 EXISTING STONE HEADER
  - 3 EXISTING STONE SILL
  - 4 SPANDREL PANEL
  - 5 NEW BRICK VENEER, INFILL USE SALVAGED BRICK TOOTH IN EXISTING PRECAST BANDING
  - 6 EXISTING METAL FLASHING
  - 7 BAY WINDOW
  - 8 GLAZING
  - 9 WOOD LOUVER ON METAL CLIPS
  - 10 EXISTING BRICK VOUSSOIRS
  - 11 EXISTING STUCCO
  - 12 METAL CLADDING
  - 13 WOOD CLADDING
  - 14 EXISTING FENCE
  - 15 EXISTING CONCRETE
  - 16 NEW EXTERIOR STUCCO SYSTEM ON EXISTING SUBSTRATE
  - 17 RESERVED
  - 18 EXISTING STUCCO
  - 19 PORCELAIN TILE
  - 20 RE-ROOF WITH R-30 INSULATION & PVC ALBEDO ROOF MEMBRANE
  - 21 INSULATED SOFFIT FIBRE-CEMENT PANELS W/ ACRYLIC STUCCO FINISH
  - 22 RECYCLED FILL
  - 23 PATCH & MAKE GOOD CONC. FLOOR SLAB ON GRANULAR
  - 24 24"x24" AIR INTAKE
  - 25 4 - 3" PIPES
  - 26 DRYER VENTS
  - 27 NEW ROOF ASSEMBLY
  - 28 PROVIDE AND INSTALL STONE SILL AND HEAD. MATCH EXISTING MATERIAL AND EXECUTION
  - 29

- GENERAL NOTES:**
- 1 SEVERELY DAMAGED BRICK TO BE REPLACED, TOOTH IN, PATCH AND MAKE GOOD ALL EXISTING SURFACES TO REMAIN.
  - 2 NEW WINDOWS TO REPLACE EXISTING, IN EXISTING OPENINGS
  - 3 CONTRACTOR TO REMOVE EXISTING WINDOWS WITH PRECAUTION NOT TO DAMAGE EXISTING BRICK VENEER, STONE SILLS AND HEADERS, BRICK SILLS, BRICK VOUSSOIRS, AND PRECAST BANDING DURING DEMOLITION
  - 4 REMOVE GRATING, DEBRIS, AND GRAVEL FOR NEW WINDOWS. REINSTALL GRATES IN GOOD CONDITION.
  - 5 NO WORK DONE IN THIS AREA



1 EAST ELEVATION - FREDERICK STREET  
A3-1 1/8"=1'-0"



2 NORTH ELEVATION  
A3-1 1/8"=1'-0"

FEB 28/06	ISSUED FOR BUILDING PERMIT	
FEB 03/06	ISSUED FOR SITE PLAN APPROVAL	
date		revisions
customer	YWCA 84 FREDERICK STREET KITCHENER, ONTARIO	
project	YWCA RENEWAL 84 FREDERICK STREET KITCHENER, ONTARIO	
title	BUILDING ELEVATIONS	

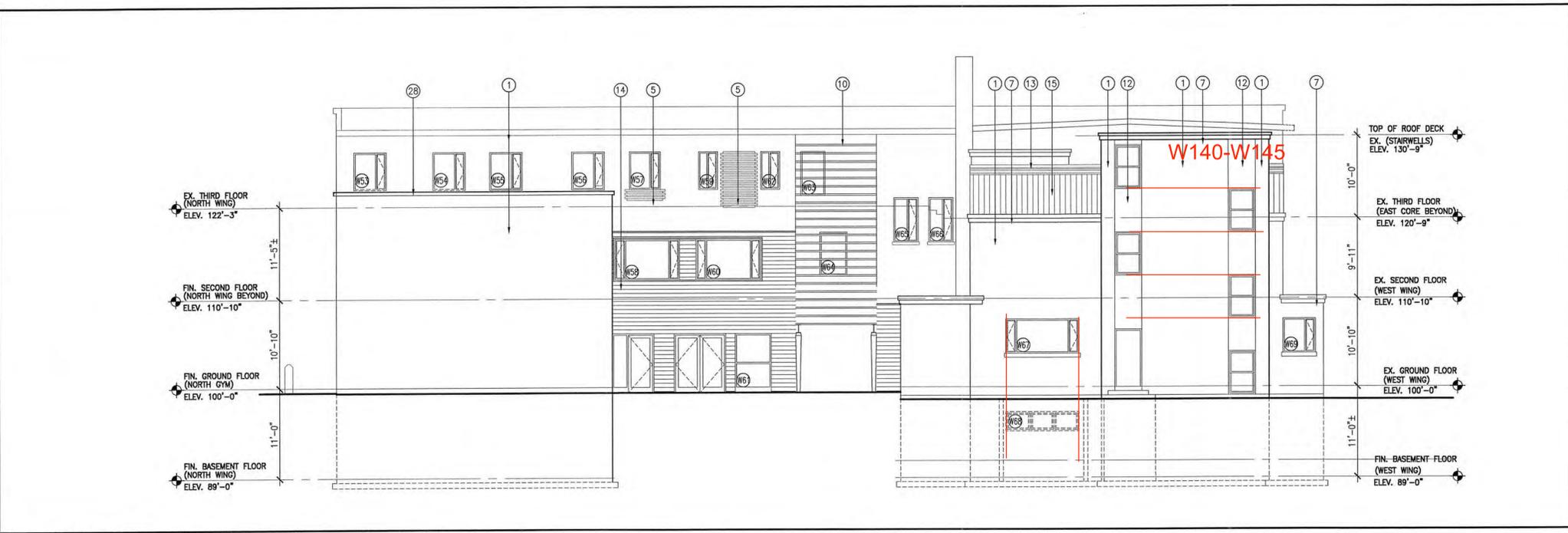
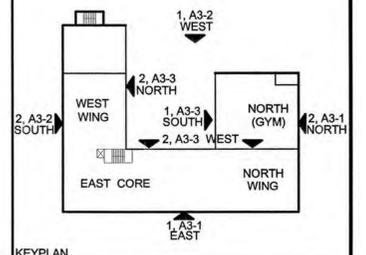
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drawn by: SR, JE  
checked by:

BCN:  
sheet no.:

**A3-1**



1 WEST ELEVATION  
A3-2 1/8"=1'-0"



2 SOUTH ELEVATION  
A3-2 1/8"=1'-0"

**BUILDING MATERIALS:**

- 1 EXISTING BRICK VENEER
- 2 EXISTING STONE HEADER
- 3 EXISTING STONE SILL
- 4 SPANDREL PANEL
- 5 NEW BRICK VENEER, INFILL USE SALVAGED BRICK TOOTH IN
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- 7 EXISTING METAL FLASHING
- 8 BAY WINDOW
- 9 GLAZING
- 10 WOOD LOUVER ON METAL CLIPS
- 11 EXISTING BRICK VOUSSOIRS
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- 13 METAL CLADDING
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- 29 PROVIDE AND INSTALL STONE SILL AND HEAD. MATCH EXISTING MATERIAL AND EXECUTION

**GENERAL NOTES:**

- 1 SEVERELY DAMAGED BRICK TO BE REPLACED, TOOTH IN, PATCH AND MAKE GOOD ALL EXISTING SURFACES TO REMAIN.
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- 4 REMOVE GRATING, DEBRIS, AND GRAVEL FOR NEW WINDOWS. REINSTALL GRATES IN GOOD CONDITION.
- 5 NO WORK DONE IN THIS AREA.

FEB 28/06	ISSUED FOR BUILDING PERMIT
FEB 03/06	ISSUED FOR SITE PLAN APPROVAL
date	revisions

customer  
**YWCA RENEWAL**  
84 FREDERICK STREET  
KITCHENER, ONTARIO

project  
**BUILDING ELEVATIONS**

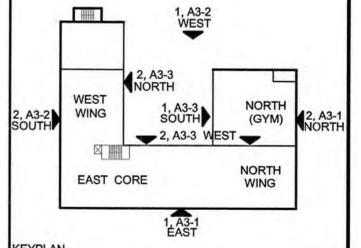
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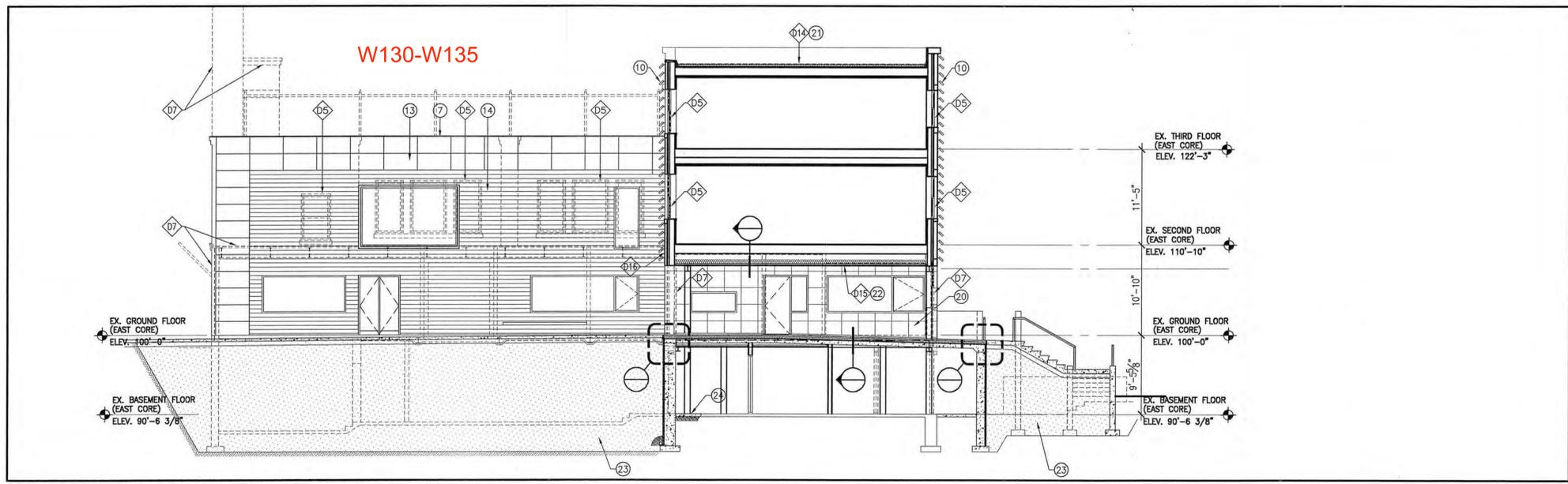


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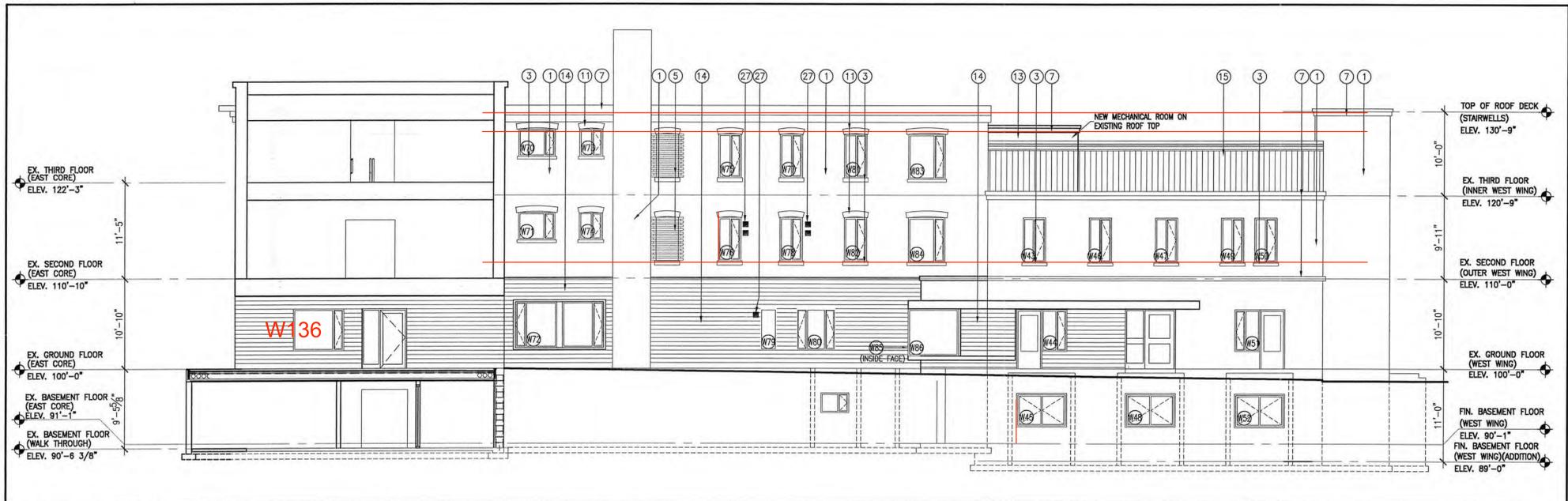


KEYPLAN

- BUILDING MATERIALS:**
- 1 EXISTING BRICK VENEER
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  - 3 EXISTING STONE SILL
  - 4 SPANDREL PANEL
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  - 5 NO WORK DONE IN THIS AREA



1 SOUTH ELEVATION GYM & WALKTHROUGH  
A3-3 1/8"=1'-0"



2 NORTH INTERIOR ELEVATION  
A3-3 1/8"=1'-0"

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date		revisions

customer  
**YWCA**  
84 FREDERICK STREET  
KITCHENER, ONTARIO

project  
**YWCA RENEWAL**  
84 FREDERICK STREET  
KITCHENER, ONTARIO

title  
**BUILDING ELEVATIONS**



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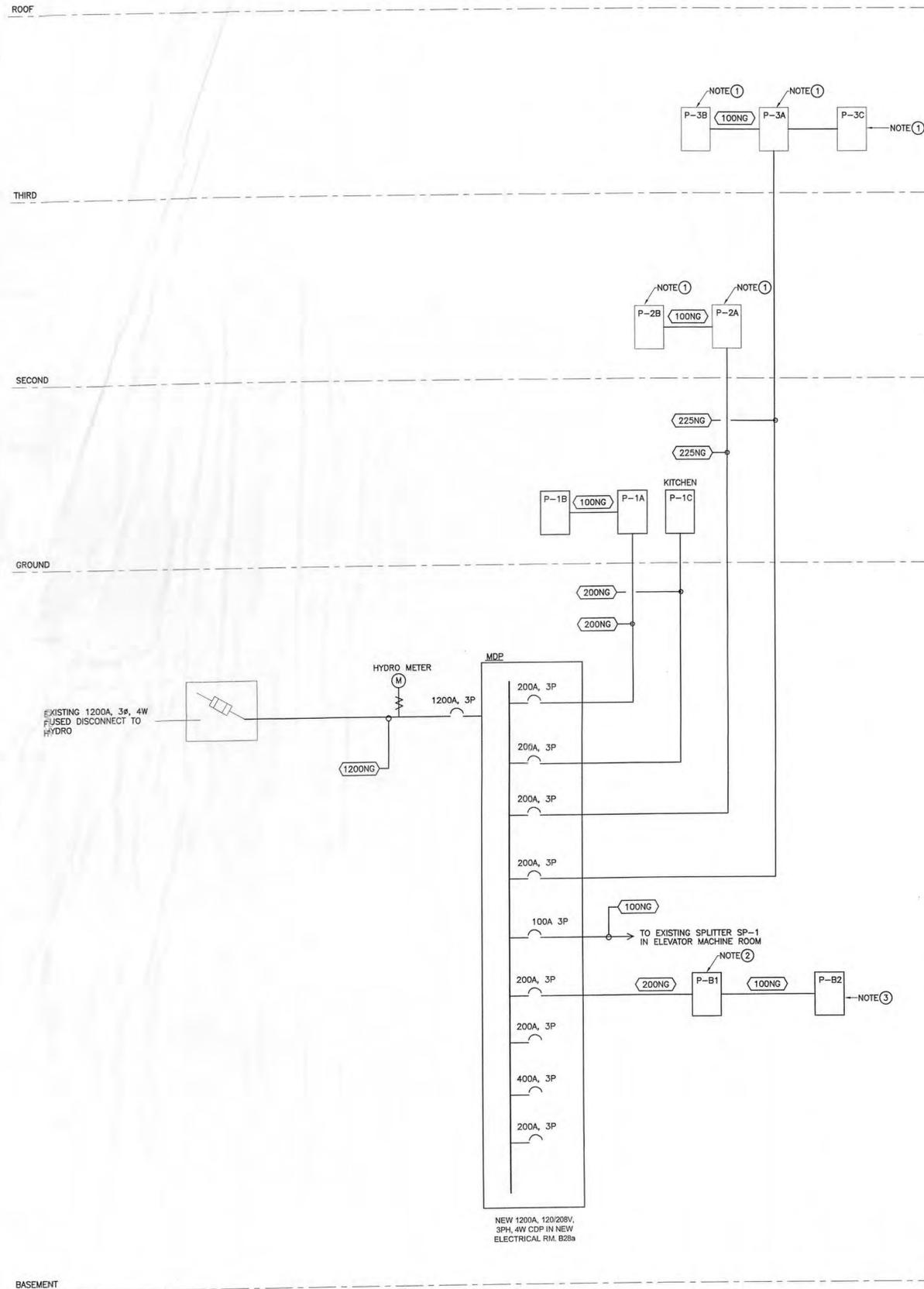


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checked by:

BCIN:  
sheet no.:  
**A3-3**

- SINGLE LINE DIAGRAM NOTES:**
- EXISTING PANEL, RELABELED.
  - REPLACE EXISTING PANEL "K" WITH NEW PANEL, LABELED AS SHOWN. REFER TO FLOOR PLANS FOR LOCATION.
  - REPLACE EXISTING 125A PANEL, WITH NO DESIGNATION, WITH NEW PANEL LABELED AS SHOWN. REFER TO FLOOR PLANS FOR LOCATIONS.

- GENERAL NOTES:**
- ALL EQUIPMENT SHOWN ARE NEW UNLESS NOTED OTHERWISE.
  - REFER TO ARCHITECTURAL DRAWINGS FOR MORE DETAILS ON PROJECT PHASING.



FEEDER	AMPACITY	PHASE CONDUCTOR	NEUTRAL	GROUND	CONDUIT
100NG	105	3#3	1#3	1#8	1 1/4"
200NG	210	3#3/0	1#3/0	1#6	2"
300NG	325	3#350MCM	1#350MCM	1#4	3"
400NG	420	2(3#3/0)	2(1#3/0)	2(1#2)	2(2")
500NG	530	2(3#250KCMIL)	2(1#250KCMIL)	2(1#2)	2(2 1/2")
800NG	885	3(3#300KCMIL)	3(1#300KCMIL)	3(1#2)	3(2 1/2")
1000NG	1185	3(3#500KCMIL)	3(1#500KCMIL)	3(1#2/0)	3(3")
1200NG	1300	4(3#350KCMIL)	4(1#350KCMIL)	4(1#3/0)	4(3")

I HAVE REVIEWED AND TAKEN RESPONSIBILITY FOR THE DESIGN WORK ON BEHALF OF THE WALTER FEDY PARTNERSHIP.

SIGNATURE: David Buck  
 NAME: DAVID BUCK  
 BCIN: 21610

FEB 28/06 ISSUED FOR BUILDING PERMIT  
 date: \_\_\_\_\_ revisions: \_\_\_\_\_

customer: **YWCA RENEWAL  
 84 FREDERICK STREET  
 KITCHENER, ONTARIO**

project: \_\_\_\_\_

title: **ELECTRICAL DETAILS  
 SINGLE LINE DIAGRAM  
 AND FEEDER SCHEDULE**

**THE walterfedy PARTNERSHIP**  
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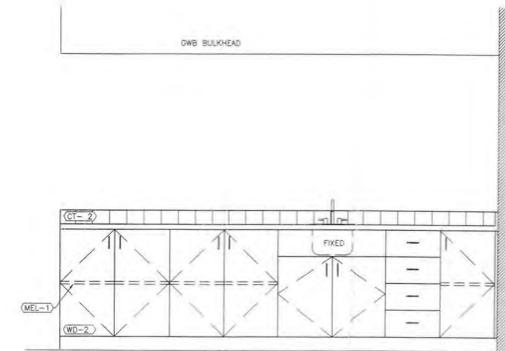
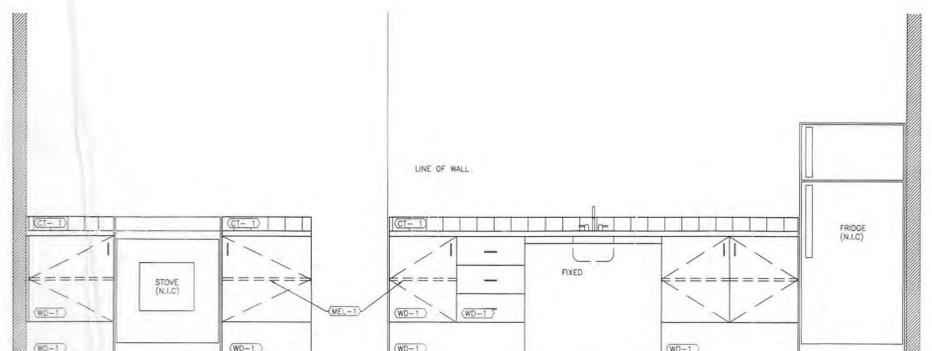
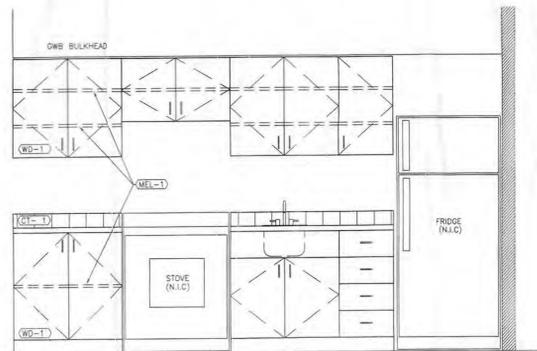
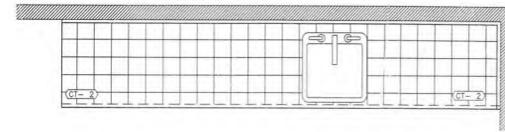
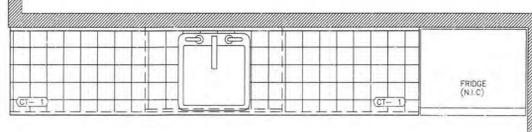
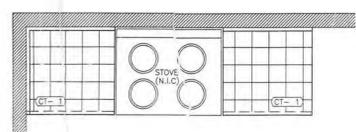
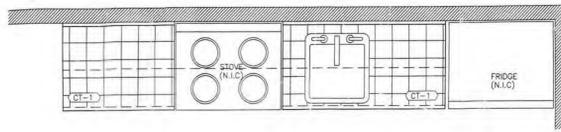


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 drawn by: JF, EP  
 checked by: \_\_\_\_\_

BCIN: \_\_\_\_\_  
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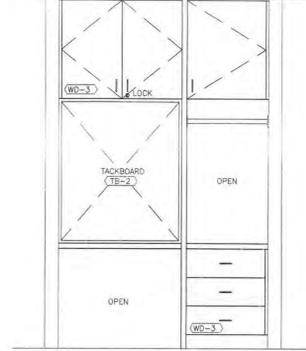
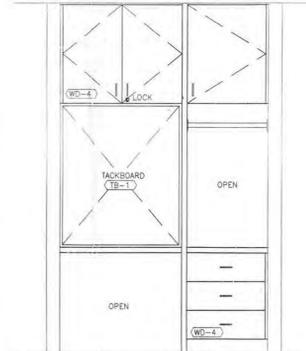
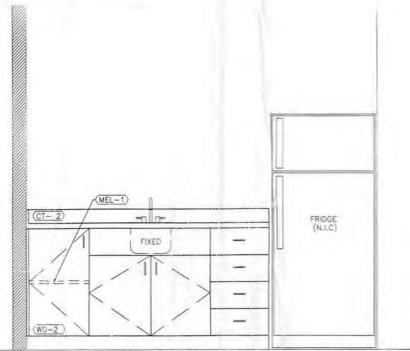
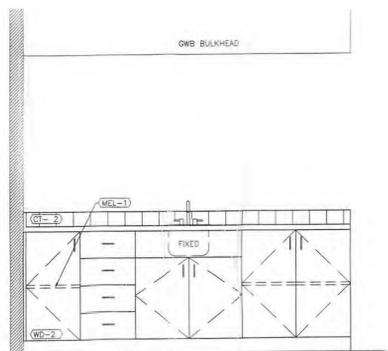
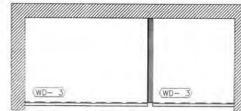
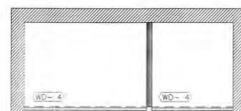
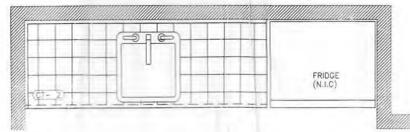
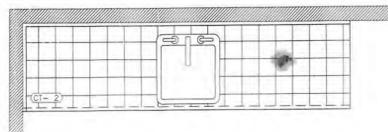
**E3-3**



1 TRANSITIONAL UNIT KITCHEN FINISHES (ALL)  
A8-2 1/2"=1'-0"

1 TRANSITIONAL UNIT (BARRIER FREE) KITCHEN FINISHES  
A8-2 1/2"=1'-0"

1 KITCHENETTE FINISHES ROOM 236  
A8-2 1/2"=1'-0"



- MILLWORK FINISHES**
- WB-1 COLUMBIA FOREST PRODUCTS EDDCOLOURS PARTICLEBOARD CP-7 CHARCOAL WITH REHAU CP-7 CHARCOAL EDGE BAND
  - WB-2 COLUMBIA FOREST PRODUCTS EDDCOLOURS PARTICLEBOARD CP-6 OLIVE WITH REHAU CP-6 OLIVE EDGE BAND
  - WB-3 COLUMBIA FOREST PRODUCTS EDDCOLOURS PARTICLEBOARD CP-10 STRAW WITH REHAU CP-10 STRAW EDGE BAND
  - WB-4 COLUMBIA FOREST PRODUCTS EDDCOLOURS PARTICLEBOARD CP-4 ZINFANDEL WITH REHAU CP-4 ZINFANDEL EDGE BAND
- TACKBOARD FINISHES**
- TB-1 FORBO LINOLEUM PRODUCT BULLETIN BOARD COLOUR # 2204
  - TB-2 FORBO LINOLEUM PRODUCT BULLETIN BOARD COLOUR # 2201
- MELAMINE FINISHES**
- MEL-1 UNIBOND, PANVAL STYLE WOODGRAINS #992 ERABLE HARDWOOD
- COUNTERTOP FINISHES**
- CT-1 CROSSVILLE CERAMIC TILE A870 SEAL TAUPÉ WITH 78 STERLING SILVER LATITRETE GROUT
  - CT-2 CROSSVILLE CERAMIC TILE A300 MAPLE SUGAR WITH 61 PARCHMENT LATITRETE GROUT
  - CT-3 CROSSVILLE CERAMIC TILE A800 EBONY WITH 45 RAVEN LATITRETE GROUT

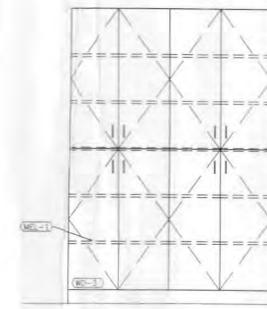
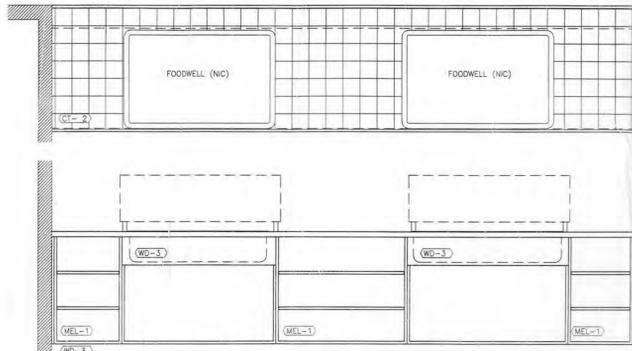
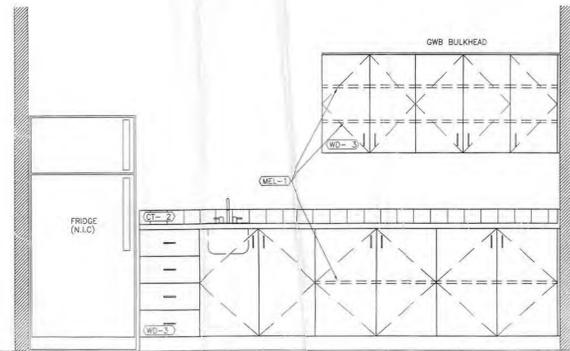
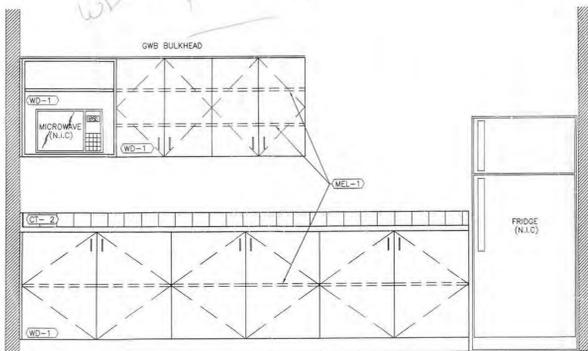
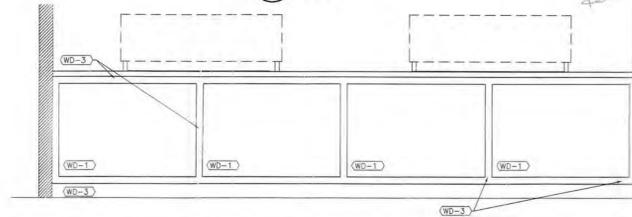
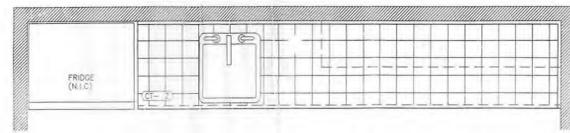
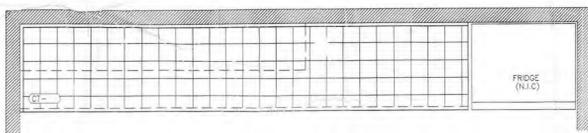
1 KITCHENETTE FINISHES ROOM 217  
A8-2 1/2"=1'-0"

1 KITCHENETTE FINISHES ROOM 305  
A8-2 1/2"=1'-0"

1 RESIDENTS DESK FINISHES (SEC. FL.)  
A8-2 1/2"=1'-0"

1 RESIDENTS DESK FINISHES (THIRD FL.)  
A8-2 1/2"=1'-0"

*Reversed  
WB-3 - Primary colour  
WB-1 -*



1 DINING ROOM FINISHES ROOM 112  
A8-2 1/2"=1'-0"

1 SERVERY FINISHES ROOM 111  
A8-2 1/2"=1'-0"

1 SERVERY ROOM 111 (DINING RM SIDE FINISHES ROOM 112)  
A8-2 1/2"=1'-0"

1 MAIN KITCHEN FINISHES ROOM 109  
A8-2 1/2"=1'-0"

MAY 08/06 ISSUED FOR CONSTRUCTION  
MAR 08/06 ISSUED FOR BID  
date: revisions  
customer  
**YWCA RENEWAL**  
84 FREDERICK STREET  
KITCHENER, ONTARIO

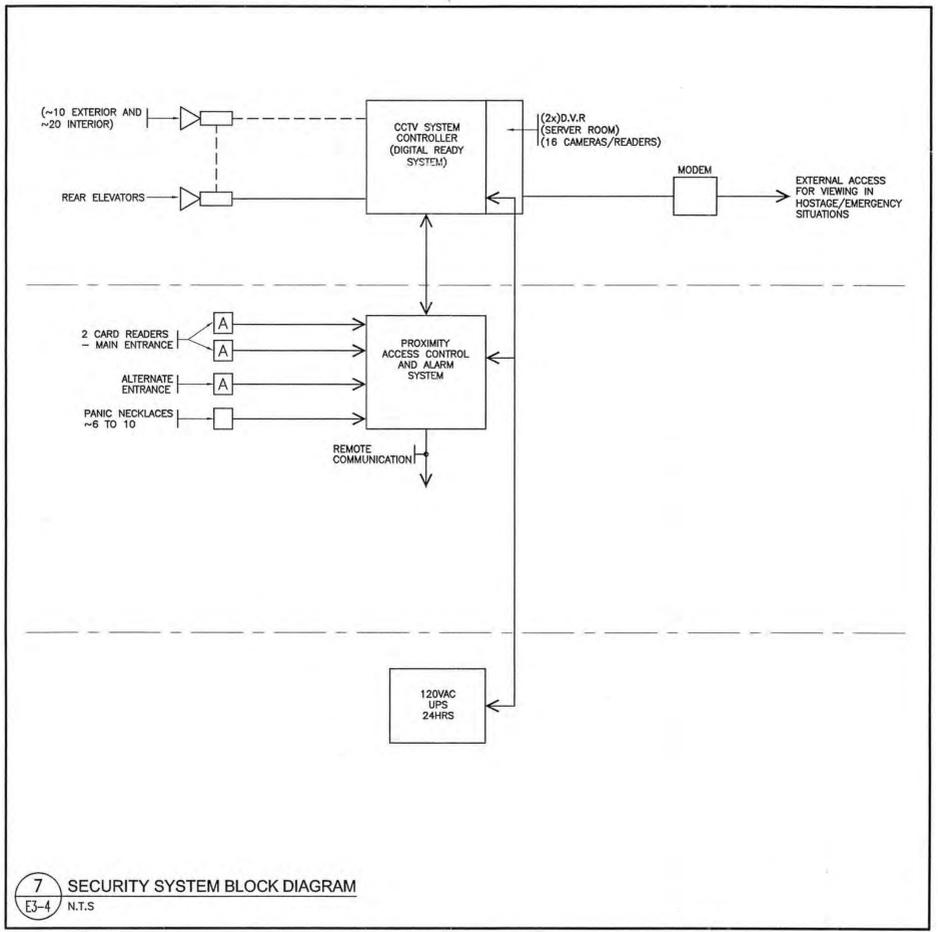
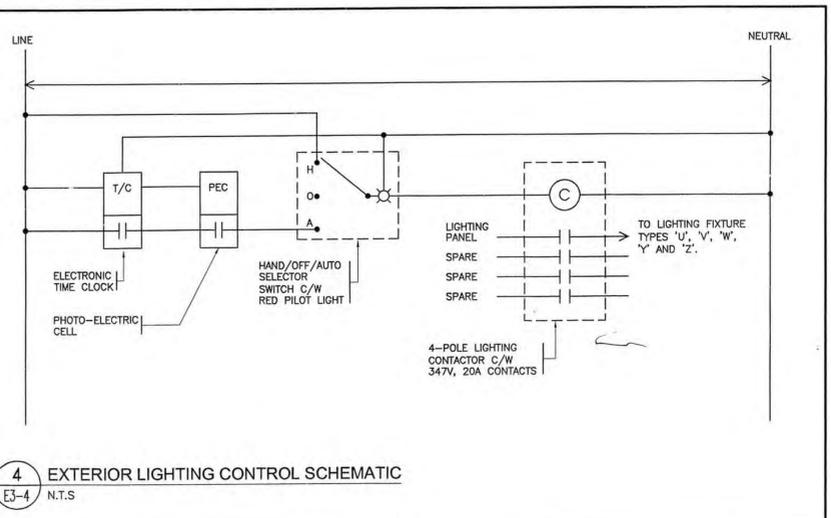
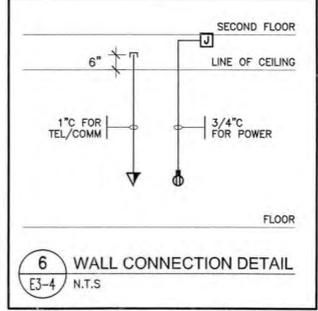
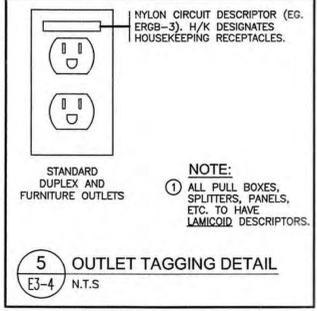
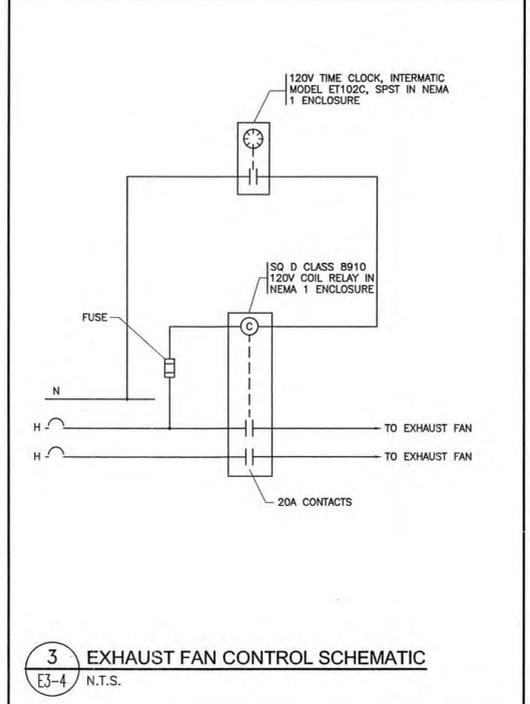
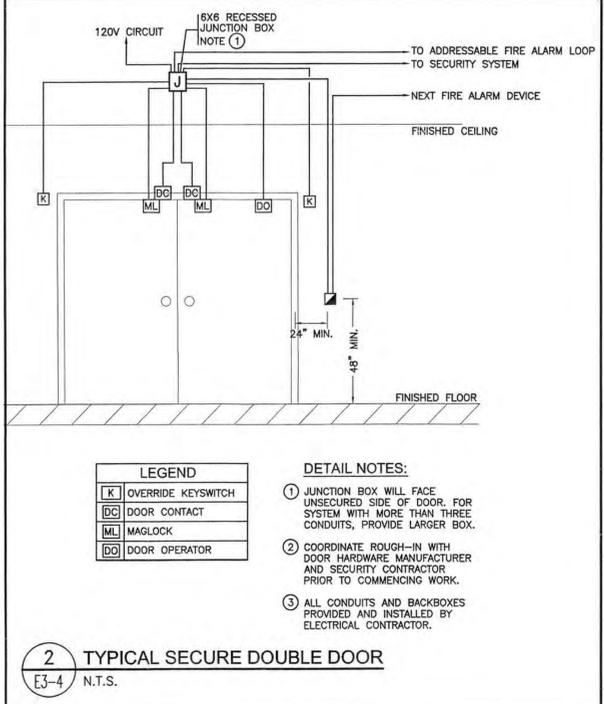
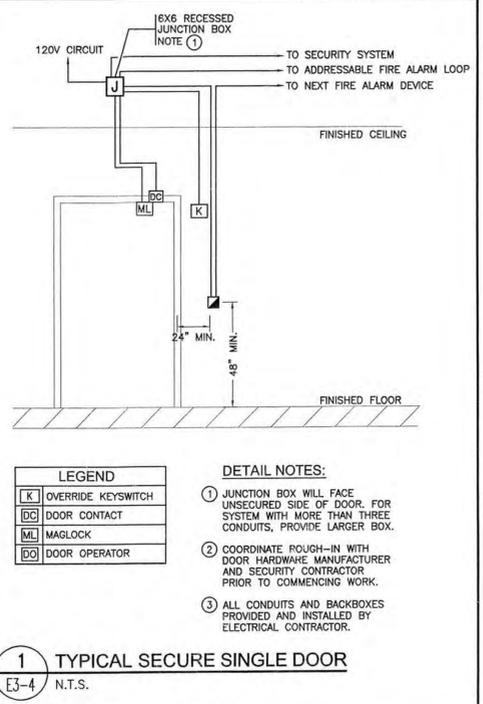
project  
title  
**MILLWORK ELEVATIONS**  
SECTIONS AND DETAILS

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job no.: 2004-0435-10  
CAD file: A8-1\_2004043510  
drawn by:  
checked by:

BCR:  
sheet no.:  
**A8-1F**



I HAVE REVIEWED AND TAKEN RESPONSIBILITY FOR THE DESIGN WORK ON BEHALF OF THE WALTER FEDY PARTNERSHIP.

SIGNATURE *David Buck*

NAME DAVID BUCK

BCIN 21610

FEB 28/06 ISSUED FOR BUILDING PERMIT

date revisions

customer

YWCA RENEWAL  
84 FREDERICK STREET  
KITCHENER, ONTARIO

project

title

MISCELLANEOUS  
ELECTRICAL DETAILS

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REGISTERED PROFESSIONAL ENGINEER  
*D. C. BUCK*  
27 FEB 2006  
PROVINCE OF ONTARIO

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scale: N.T.S.  
date: 02/21/2006  
job no.: 2004-0433-10  
CAD file: E3-4\_2004-0433-10  
drawn by: JP  
checked by:

BCIN: sheet no.: **E3-4**



















# YWCA

KITCHENER - WATERLOO

A TURNING POINT  
FOR WOMEN

## YWCA RENEWAL 84 FREDERICK STREET

KITCHENER, ONTARIO  
2004-0433-10

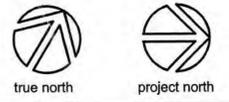
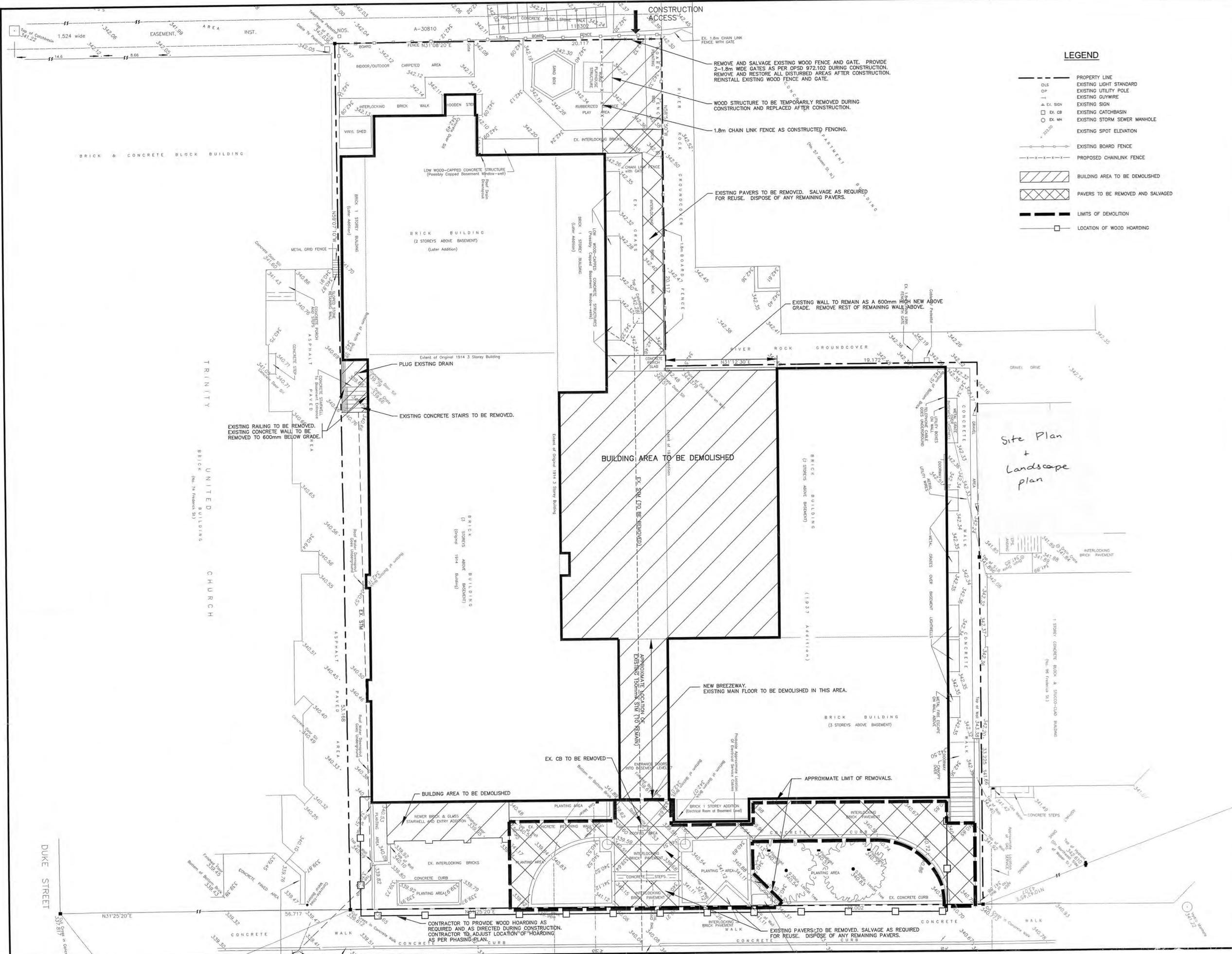
*General Notes - others inside*  
*Please add roof anchors to all roofs - if reasonable cost*

### LIST OF DRAWINGS

- CIVIL
- C1-1 Site Plan and Landscape Plan
- C2-1 Existing Conditions and Removals Plan
- C3-1 Site Servicing and Grading Plan
  
- LANDSCAPE
- L1-1 Landscape Plan
  
- ARCHITECTURAL
- A1-1 Building Code Analysis
- A1-2 Phasing Plan
- A1-3 Demolition Basement Plan
- A1-4 Demolition Ground Floor Plan
- A1-5 Demolition Second Floor Plan
- A1-6 Demolition Third Floor Plan
- A1-7 Demolition Elevations
- A1-8 Demolition Elevations
- A2-1 Basement Floor Plan
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- A2-6 Reflected Ceiling Plan Basement
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- A3-1 Exterior Elevations
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- A4-1 Building Sections
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- A5-3 Section Details
- A5-4 *Plin Details*
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- A7-1 Enlarged Washroom Floor Plans and Elevations
  
- STRUCTURAL
- S1-1 Typical Details and General Notes
- S2-1 Foundation Plan
- S2-2 Ground Floor Framing Plan
- S2-3 Second Floor Framing Plan
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- S2-5 Roof Framing Plan
- S5-1 Foundation Sections
- S5-2 Sections, Details and Elevations
- S5-3 Sections and Details
  
- MECHANICAL
- MD-1 Basement Demolition Plan
- MD-2 Ground Floor Demolition Plan
- MD-3 Second Floor Demolition Plan
- MD-4 Third Floor Demolition Plan
- M2-1 Basement Floor Plan, Plumbing Layout and Legend
- M2-2 Ground Floor Plan, Plumbing Layout
- M2-3 Second Floor Plan, Plumbing Layout
- M2-4 Third Floor Plan, Plumbing Layout
- M2-5 Basement Floor HVAC Layout
- M2-6 Ground Floor HVAC Layout
- M2-7 Second Floor HVAC Layout
- M2-8 Third Floor HVAC, Mechanical Room and Schematic
- M2-9 Basement Floor Plan, Radiation Layout
- M2-10 Ground Floor Plan, Radiation Layout
- M2-11 Second Floor Plan, Radiation Layout
- M2-12 Third Floor Plan, Radiation Layout
  
- ELECTRICAL
- E1-1 Electrical Site Plan and Legend
- E2-1 Basement Lighting Layout
- E2-2 Ground Floor Plan Lighting Layout
- E2-3 Second Floor Plan Lighting Layout
- E2-4 Third Floor Plan Lighting Layout
- E2-5 Basement Plan Power and System Layout
- E2-6 Ground Plan Power and System Layout
- E2-7 Second Floor Plan Power and System Layout
- E2-8 Third Floor Plan Power and System Layout
- E2-9 Roof Plan Layouts - Power, Lighting and Systems
- E3-1 Electrical Schedules
- E3-2 Fire Alarm Zoning Plans
- E3-3 Electrical Details - Single Line Diagram And Feeder Schedule
- E3-4 Electrical Details
- E3-5 *Reserved*
- E3-6 *Electrical Panel Schedule*
- E4-1 Enlarged Plans
- E4-2 *Reserved*
- ED-1 Basement Plan - Electrical Demolition
- ED-2 Ground Floor Plan - Electrical Demolition
- ED-3 Second Floor Plan - Electrical Demolition
- ED-4 Third Floor Plan - Electrical Demolition

  
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**BENCHMARK**  
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FEB.27/06 ISSUED FOR BUILDING PERMIT  
 FEB.03/06 ISSUED FOR SITE PLAN APPROVAL

date	revisions

customer  
**YWCA**  
 84 FREDERICK STREET  
 KITCHENER, ONTARIO

project  
**YWCA RENEWAL**  
 84 FREDERICK STREET  
 KITCHENER, ONTARIO

title  
**EXISTING CONDITIONS AND REMOVALS PLAN**

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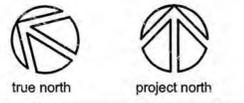
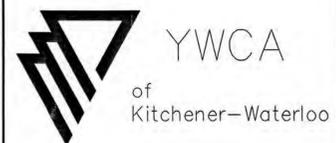
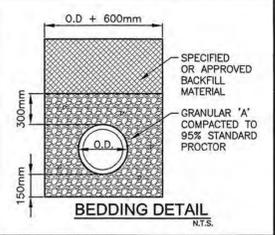
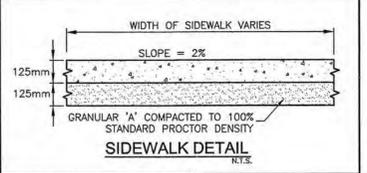
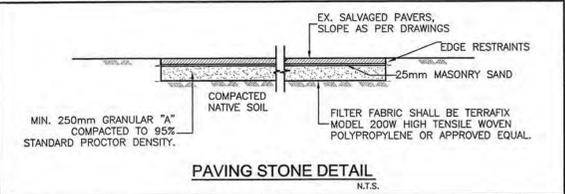
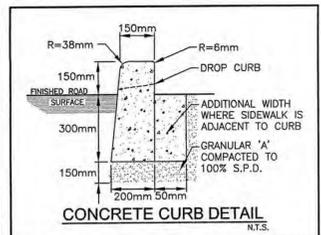
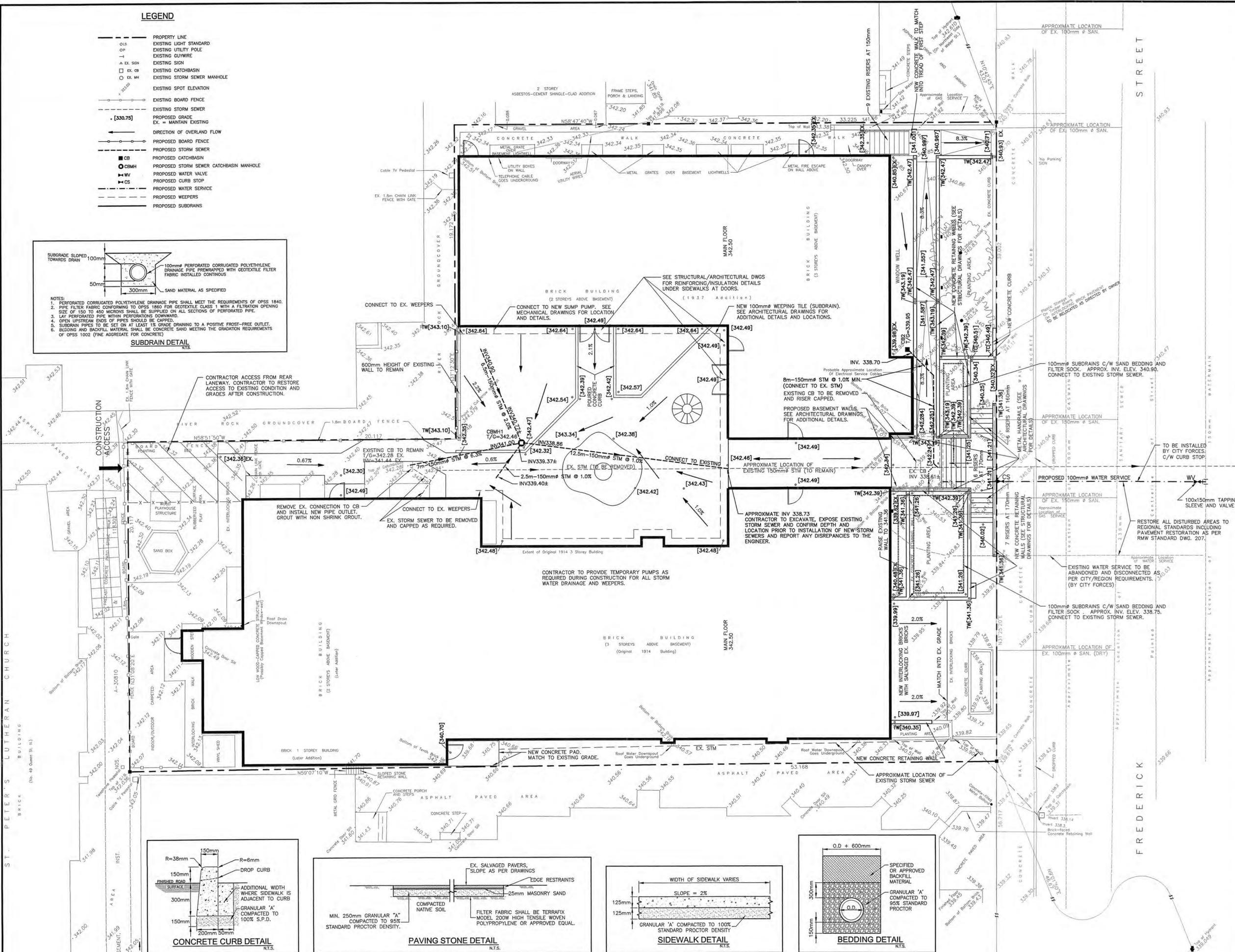
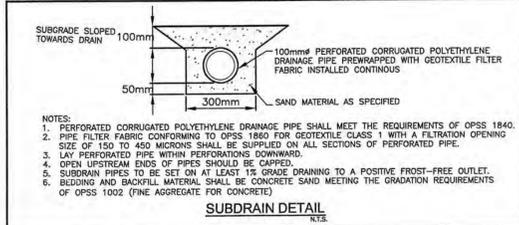
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 job no.: 2004-0435-10  
 CAD file: C1-1, 2004-133-10  
 drawn by: A.M.  
 checked by:   
 sheet no.: **C1-2**

**LEGEND**

- PROPERTY LINE
- OLS EXISTING LIGHT STANDARD
- OP EXISTING UTILITY POLE
- EXISTING GUYWIRE
- ▲ EX. SIGN
- EX. CB
- EX. MH
- EXISTING CATCHBASIN
- EXISTING STORM SEWER MANHOLE
- EXISTING SPOT ELEVATION
- EXISTING BOARD FENCE
- EXISTING STORM SEWER
- [330.75] PROPOSED GRADE
- EX. = MAINTAIN EXISTING
- DIRECTION OF OVERLAND FLOW
- PROPOSED BOARD FENCE
- PROPOSED STORM SEWER
- CB PROPOSED CATCHBASIN
- CBMH PROPOSED STORM SEWER CATCHBASIN MANHOLE
- WV PROPOSED WATER VALVE
- CS PROPOSED CURB STOP
- PROPOSED WATER SERVICE
- PROPOSED WEEPERS
- PROPOSED SUBDRAINS



- GENERAL NOTES**
- LEGAL PROPERTY LINE AND TOPOGRAPHICAL INFORMATION TAKEN FROM TOPOGRAPHICAL SURVEY OF PART OF LOTS 4 AND 5 R. P. 388 IN THE CITY OF KITCHENER BY METZ & LORENTZ LTD. DATED DECEMBER 23, 2004.
  - LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THESE SERVICES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL DAMAGES THAT OCCUR DUE TO HIS FAILURE TO LOCATE AND PRESERVE THESE SERVICES.
  - ANY AREA DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO ITS EXISTING CONDITION OR BETTER TO THE SATISFACTION OF THE OWNER AND MUNICIPALITY. THIS INCLUDES ASPHALT, GRANULAR, PAVING STONE, TOPSOIL, SOD, ETC.

**BENCHMARK**

TOP OF HORIZONTAL CONTROL MONUMENT NO. 028985418 (BEING A BRASS PLUG SET IN THE CURB AT THE MOST NORTHERLY CORNER OF THE INTERSECTION OF KING STREET AND FREDERICK STREET), IT BEING ASSUMED 335.144 METRES (AS PUBLISHED ON A TOPOGRAPHICAL SURVEY PREPARED FOR THE CITY OF KITCHENER BEARING OUR FILE NUMBER K1-618-26) WHICH WAS RELATED TO A PREVIOUS GEODETIC BENCH MARK (NO. 670047) WHICH HAD BEEN DISTURBED.

FEB.27/06 ISSUED FOR BUILDING PERMIT  
 FEB.13/06 SUBMITTED FOR REGION/CITY APPROVAL

customer: **YWCA**  
**84 FREDERICK STREET**  
 KITCHENER, ONTARIO

project: **YWCA RENEWAL**  
**84 FREDERICK STREET**  
 KITCHENER, ONTARIO

file: **SITE SERVICING AND GRADING PLAN**

**THE Walterfedy PARTNERSHIP**  
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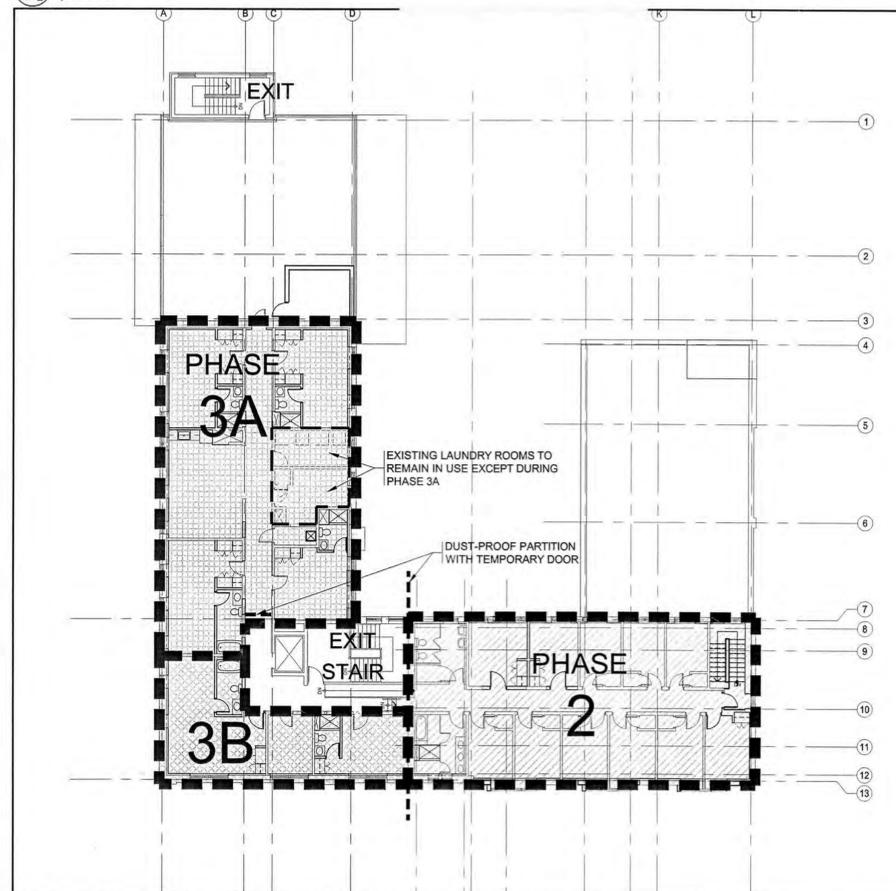
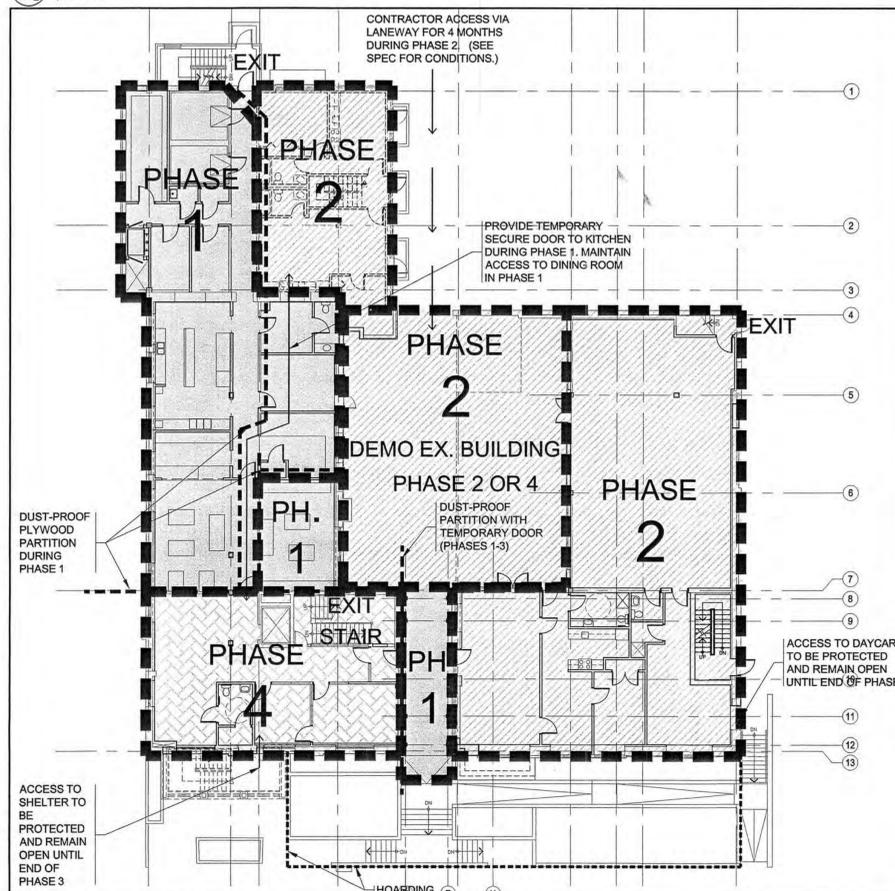
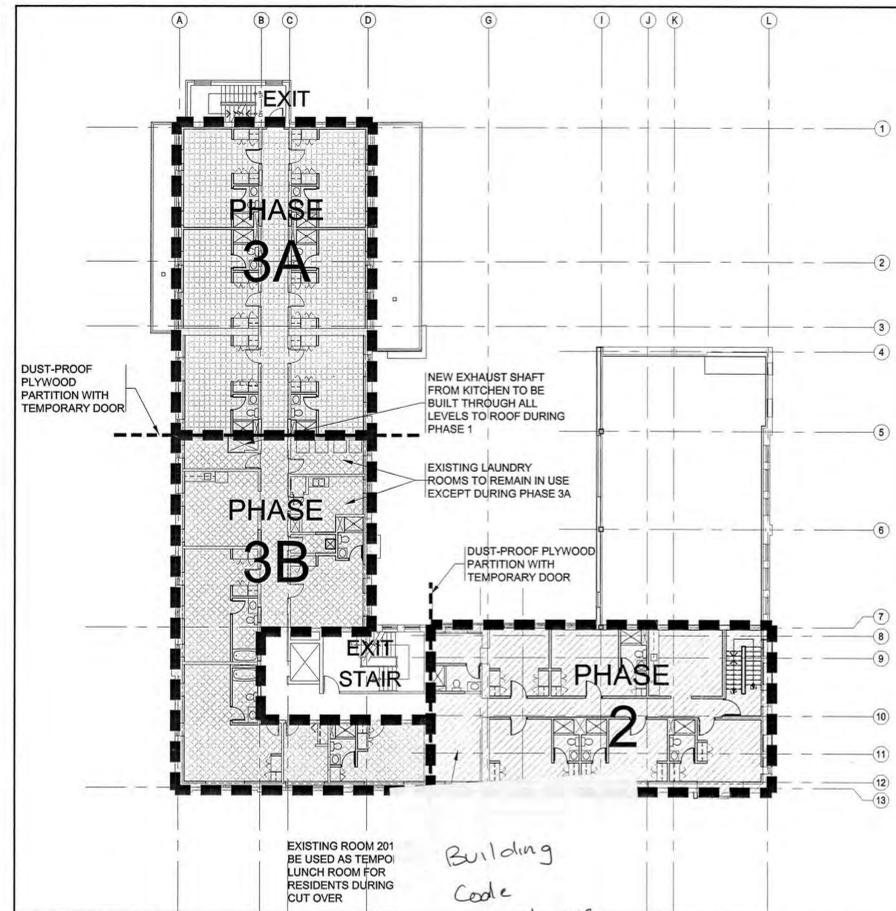
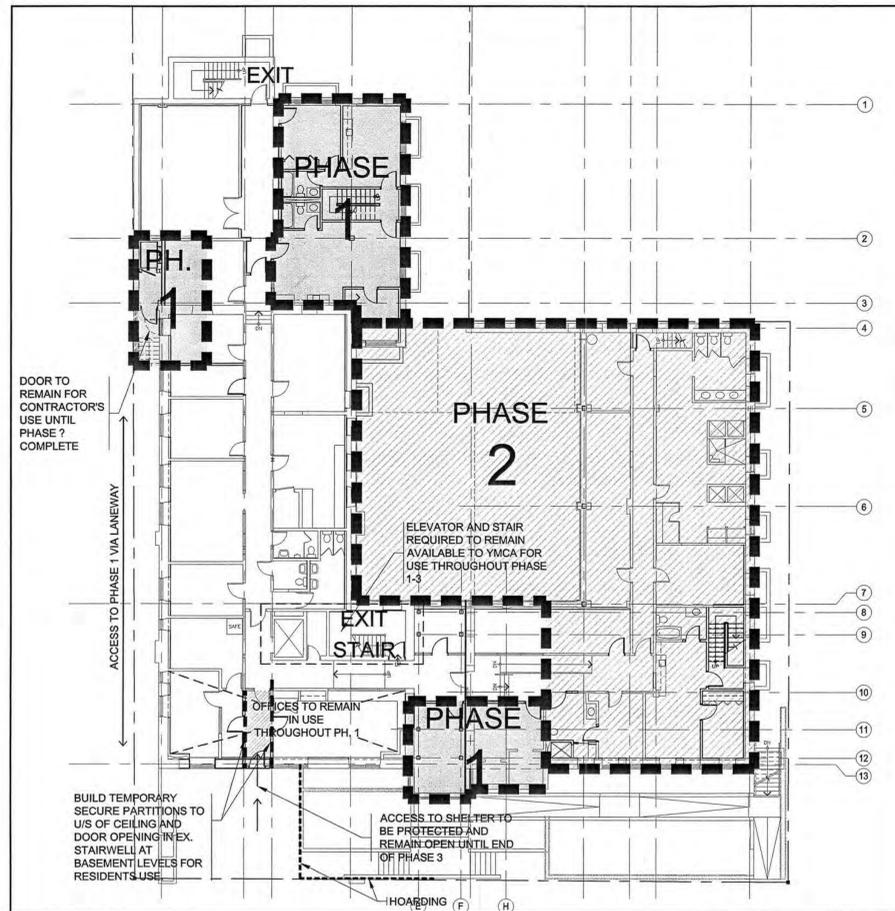
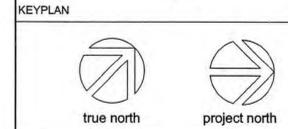
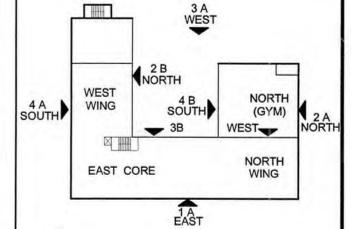
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 drawn by: A.M.  
 checked by:

sheet no.: **C1-3**



FEB 28/06	ISSUED FOR BUILDING PERMIT
FEB 28/06	ISSUED FOR APPROVAL
date	revisions

customer

YWCA  
84 FREDERICK STREET  
KITCHENER, ONTARIO

project  
YWCA RENEWAL  
84 FREDERICK STREET  
KITCHENER, ONTARIO

title  
PHASING PLAN

**THE walterfedy PARTNERSHIP**  
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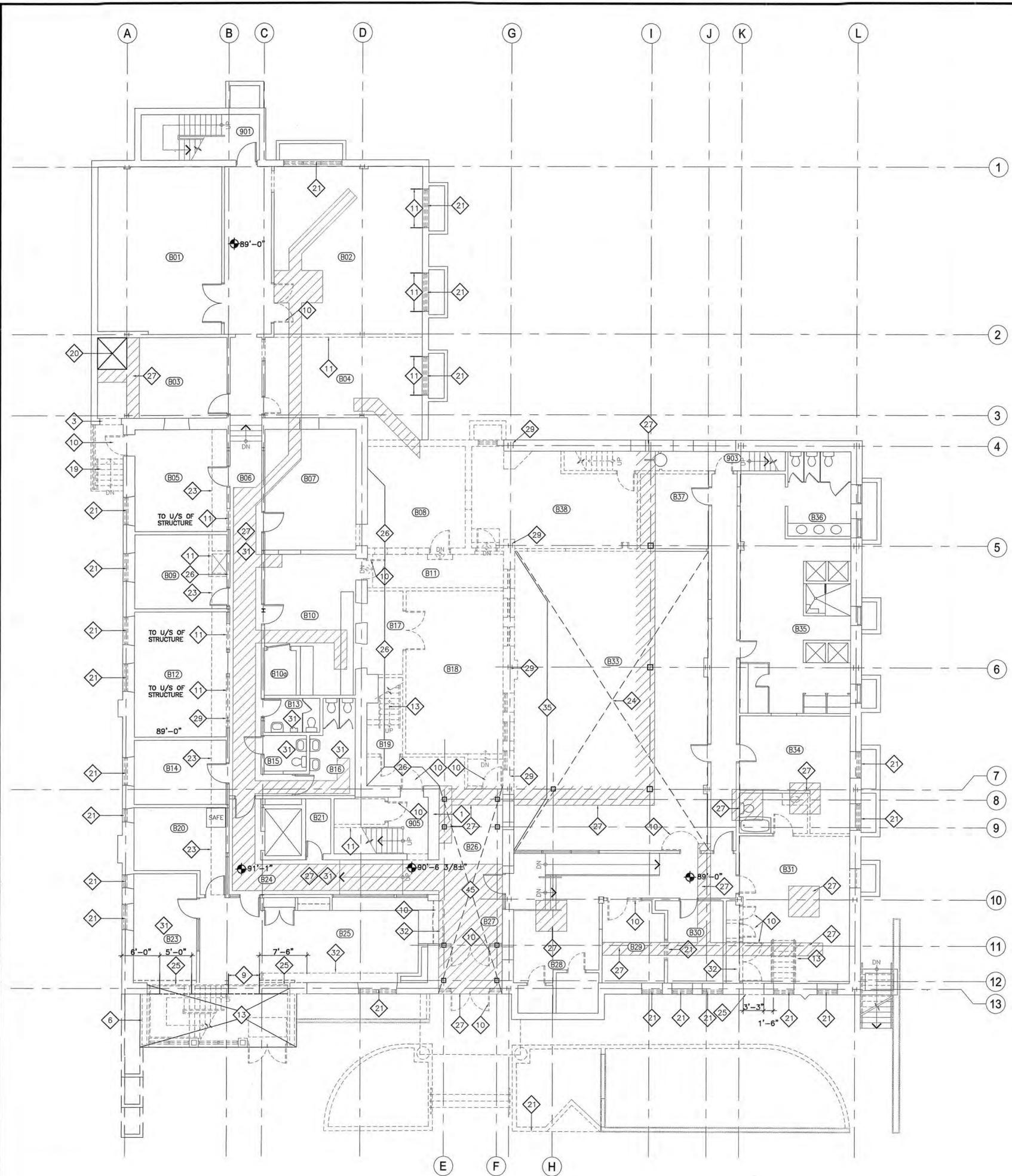
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job no.: 2004-0433-10  
CAD file: A1-2\_2004043310  
drawn by: MB  
checked by:

sheet no.:  
**A1-2**



**DEMOLITION NOTES**

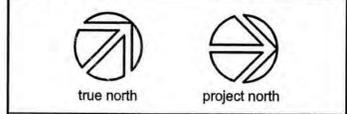
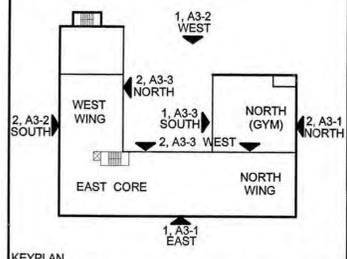
- 1 SAW-CUT FACE BRICK AND BACK-UP BLOCK OR TOOTH-CUT AS REQUIRED. SALVAGE BRICK AND BLOCK FOR PROJECT USE AS REQUIRED. FORM NEW OPENING IN EXISTING CAVITY WALL TO PLAN DIMENSION SHOWN. EXTERIOR WYTHE SHALL HAVE TOOTHED-IN JOISTS. INTERIOR WYTHE SHALL BE SAW-CUT. REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR ELEVATION OF OPENING AND LINTEL TYPE.
- 14 AS NOTE 1 BUT BOTH WYTHE SAW-CUT.
- 2 TEMPORARY OPENING EXISTS. FORM NEW OPENING IN EXISTING CAVITY WALL TO PLAN DIMENSION SHOWN USING TOOTHED JOISTS. HAND OVER TEMPORARY LINTEL TO PROJECT MANAGER.
- 3 FORM NEW OPENING IN EXISTING WALL TO PLAN DIMENSION SHOWN USING TOOTHED JOISTS. MASONRY SHALL BE OF SALVAGED OR NEW MATERIAL TO MATCH EXISTING. REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR ELEVATION OF OPENING AND STRUCTURAL SUPPORT. DISPOSE OF ALL UNWANTED MATERIAL.
- 4 CAREFULLY REMOVE FACING BRICK AND CONCRETE COPING STONES AND SALVAGE FOR USE AS REQUIRED. REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR SCOPE OF REMOVAL AND NEW WORK. DISPOSE OF ALL UNWANTED MATERIAL.
- 5 REMOVE AND DISPOSE OF WINDOW ASSEMBLY AS APPLICABLE. CAREFULLY SAW-CUT FACING BRICK BETWEEN WINDOW SILL AND (NEW) FLOOR BELOW, AND SALVAGE FOR PROJECT USE AS REQUIRED. FORM NEW FULL-HEIGHT OPENING. EXTERIOR WYTHE (FACE BRICK) SHALL HAVE TOOTHED-IN JOISTS. INTERIOR WYTHE (CONC. BLOCK) SHALL BE SAW-CUT. MASONRY SHALL BE OF MATERIAL AND THICKNESS TO MATCH EXISTING. DISPOSE OF ALL UNWANTED MATERIAL.
- 6 REMOVE ENTIRE BUILDING IN THIS AREA, FROM ROOF TO GROUND FLOOR LEAVE BASEMENT WALLS INTACT, TO RECEIVE NEW ROOF STRUCTURE. PATCH AND MAKE GOOD.
- 7 TEMPORARY OPENING EXISTS. HAND OVER TEMPORARY LINTEL TO PROJECT MANAGER.
- 8 REMOVE VENT GRILLE AND LOUVRE AND DISPOSE OF.
- 9 CUT 7'-0" HIGH OPENING FOR TEMPORARY ACCESS. INSTALL SECURITY DOOR AND FRAME
- 10 REMOVE COMPLETE DOOR AND FRAME ASSEMBLY AND MOVE TO STORAGE FOR RE-USE. LINTEL TO REMAIN
- 11 REMOVE EXISTING INTERIOR WALL ASSEMBLY, AND DISPOSE OF UNWANTED MATERIAL IN SEPARATE MATERIAL BINS.
- 12 REMOVE AND DISPOSE OF FIRE HOSE CABINET.
- 13 REMOVE EXISTING STAIRWELL IN ITS ENTIRETY, INCLUDING EXTERIOR WALLS, WINDOWS, ROOF, STAIR, AND SLAB. (FOUNDATIONS TO BE CUT DOWN TO 12" BELOW GRADE).
- 14 CAREFULLY REMOVE MOVEABLE PARTITION ASSEMBLY, GUIDE RAILS AND MOTORS. HAND OVER TO OWNER OR DISPOSE OF IF NOT REQUIRED.
- 15 CONCRETE FOUNDATION WALL TO BE SAW-CUT TO BELOW EXISTING CONCRETE FLOOR SLAB, OR OTHERWISE SIZE NOTED.
- 16 REMOVE AND DISPOSE OF DRINKING FOUNTAIN.
- 17 WHERE EXISTING PLUMBING FIXTURES ARE REMOVED, REPAIR CONCRETE SLAB.
- 18 REMOVE UPPER SECTION OF FOUNDATION WALL, EXPOSED CONCRETE STRUCTURE, AREA WELL GRILLES ETC. TO ENABLE NEW CONCRETE SLAB TO BE CONSTRUCTED. REFER TO STRUCTURAL AND ARCHITECTURAL DRAWINGS FOR INTENT.
- 19 REMOVE EXISTING CONC. STAIRS, CANOPY, PLANTERS AND MISC. ITEMS INCLUDING HANDRAILS. CUT FOUNDATIONS DOWN TO MIN. 12" BELOW FINISHED GRADE EXCEPT REMOVE ENTIRELY WHERE NEW FOOTINGS ARE REQUIRED. STOCKPILE PAVING STONES FOR RE-USE
- 20 REMOVE EXISTING CONCRETE SLAB.
- 21 CAREFULLY REMOVE AND DISPOSE OF EXISTING WINDOW ASSEMBLY, MAKE GOOD ADJACENT SURFACES TO ACCEPT NEW WINDOW. LINTEL TO REMAIN.
- 22 REMOVE PARAPET FOR NEW MECHANICAL ROOM. REFER TO DRAWING 7/A5-1 FOR DETAIL AND TO ROOF PLAN A2-5.
- 23 REMOVE EXISTING BULKHEAD. REFER TO REFLECTED CEILING PLANS FOR NEW LAYOUT.
- 24 EXISTING WOOD SPRUNG FLOOR SYSTEM TO BE SALVAGED FOR RE-USE.
- 25 EXISTING WOOD FLOORING TO BE SALVAGED FOR RE-USE.
- 26 SAWCUT EXISTING CONCRETE FOUNDATION WALL TO FORM NEW OPENING IN EXISTING WALL.
- 27 REMOVE EXISTING WALL FINISHES (PLASTER, GYP. BD., ETC.). REPAIR EXISTING FACE OF CONCRETE WALL & PREP. SURFACE TO RECEIVE WATERPROOFING.
- 28 SAWCUT EXISTING CONCRETE SLAB TO ALLOW FOR INSTALLATION OF FOOTINGS/NEW SERVICES AS REQUIRED. (REFER TO STRUCTURAL AND MECHANICAL DRAWINGS FOR NEW WORK).
- 29 LINE OF BUILDING CUT THROUGH ALL ASSEMBLIES - ROOF, WALLS, FLOORS INCLUDING ALL FINISH MATERIALS AND SURFACES.
- 30 EXISTING STRUCTURAL SUPPORTS TO BE PROTECTED DURING DEMOLITION PROCESS.
- 31 EXISTING CUBBIES TO BE HANDED OVER TO OWNER FOR RELOCATION.
- 32 EXISTING FLOORING TO BE REMOVED C/W ADHESIVE.
- 33 EXISTING MILLWORK TO BE REMOVED.
- 34 EXISTING VCT OR VAT FLOOR FINISH TO BE REMOVED.
- 35 EXISTING FRIDGE, FREEZER C/W SHELVING, AND ALL KITCHEN EQUIPMENT DESIGNATED \* TO BE REMOVED FOR REUSE IN NEW KITCHEN. REMAINDER OF STAINLESS STEEL TO BE REMOVED AND SOLD FOR RECYCLING OR REUSE.
- 36 EXISTING MIRROR TO BE REMOVED FOR RECYCLING IN USABLE CONDITION.
- 37 REMOVE PARTITIONS AND ALL BUILT-INS IN DAYCARE SPACE
- 38 REMOVE EXISTING STAGE C/W WITH STAIRS AND MISC.
- 39 REMOVE AND DISPOSE OF EXISTING WINDOW ASSEMBLY. PATCH AND MAKE GOOD EXISTING OPENING WITH SALVAGED BLOCK & BRICK.
- 40 CAREFULLY REMOVE EXISTING DOOR/WINDOW PARTITION.
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- 9) SALVAGE ALL BRICK VENEER, CLEAN MORTAR, STACK & STORE ON SITE FOR REUSE.

**ROOM SCHEDULE**

- B01 CLASSROOM
- B02 CLASSROOM
- B03 QUIET ROOM
- B04 OFFICE
- B05 OFFICE
- B06 CORRIDOR
- B07 STORAGE
- B08 MAINTENANCE
- B09 OFFICE
- B10 BOILER ROOM
- B10A ELEVATOR SERVICE ROOM
- B11 CORRIDOR
- B12 OFFICE
- B13 MENS WASHROOM
- B14 OFFICE
- B15 BARRIER FREE WASHROOM
- B16 WOMENS WASHROOM
- B17 STORAGE CLOSET
- B18 MEETING ROOM
- B19 STAIR CORRIDOR
- B20 OFFICE
- B21 STORAGE
- B22 OFFICE
- B24 CORRIDOR
- B25 FRONT OFFICE
- B26 ENTRY LOBBY
- B27 ENTRY VESTIBULE
- B28 LOUNGE
- B29 OFFICE
- B30 OFFICE
- B31 TRANSITIONAL UNIT
- B32 CORRIDOR
- B33 EXERCISE ROOM
- B34 UNIT
- B35 SHOWER ROOM
- B36 WASHROOM
- B37 MESSAGE ROOM
- B38 MESSAGE ROOM
- B01 EXIT STAIR
- B02 EXIT STAIR
- B03 EXIT STAIR
- B04 EXIT STAIR
- B05 COMMUNICATION STAIR



*Remove all toilet sand plus all drains*

FEB 28/06	ISSUED FOR BUILDING PERMIT
FEB 28/06	ISSUED FOR BUILDING PERMIT
date	revisions
customer	YWCA 84 FREDERICK STREET KITCHENER, ONTARIO
project	YWCA RENEWAL 84 FREDERICK STREET KITCHENER, ONTARIO
title	BASEMENT DEMOLITION PLAN

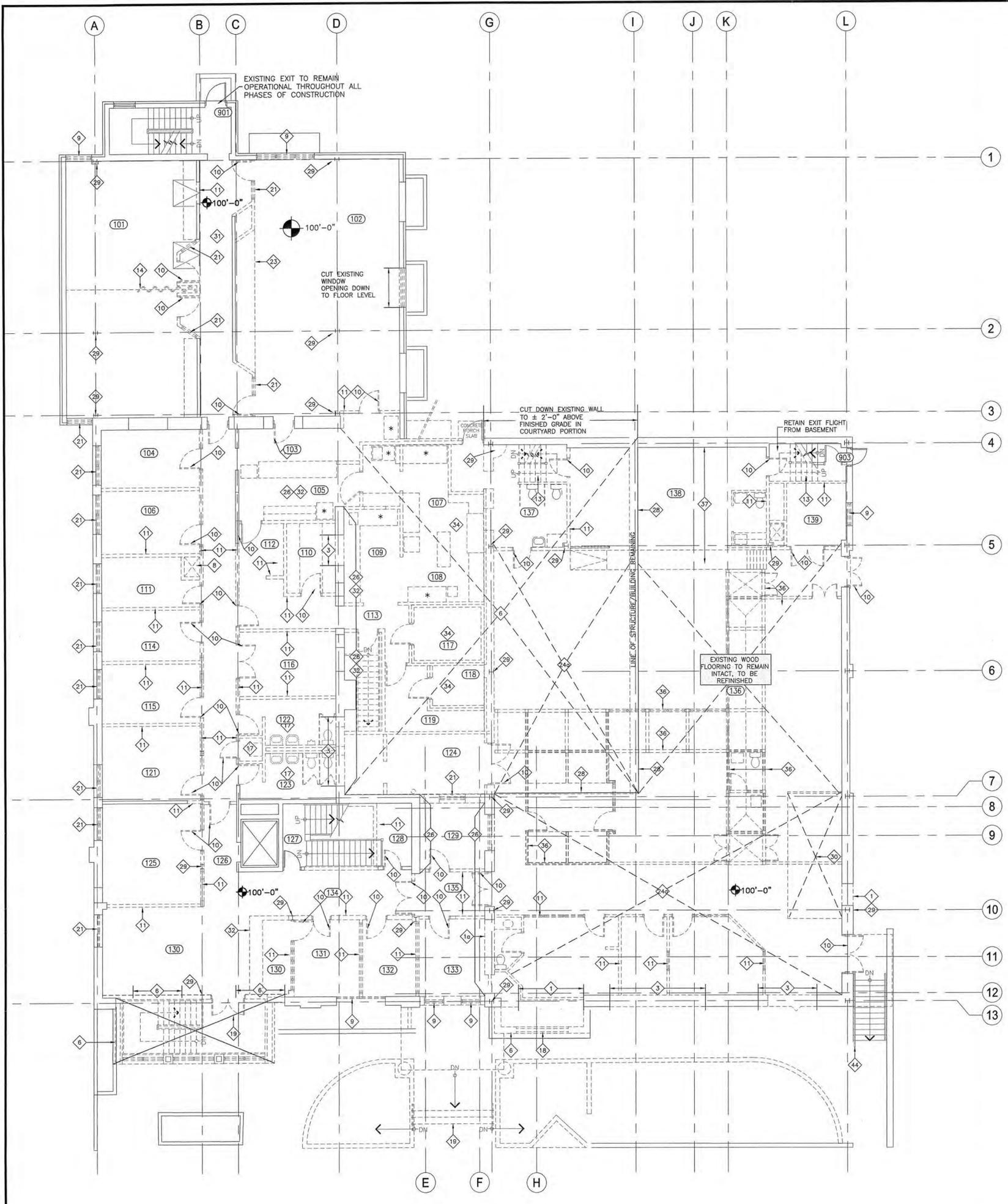
**THE walterfedy PARTNERSHIP**  
ARCHITECTS • ENGINEERS  
546 Belmont Ave. W., Kitchener, Ontario, N2M 5E3  
P. 519-576-2150 F. 519-576-5499 www.wtwp.com

The contractor shall check and verify all dimensions and report any errors or omissions to the consultant before commencing or proceeding with any work. Do not scale this drawing.

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scale: 1/8"=1'-0"  
date: FEB 28/06  
job no.: 2004-0433-10  
CAD file: A1-1\_20040433-10  
drawn by: SR, JE  
checked by:

BCIN:  
sheet no.: **A1-3**



**DEMOLITION NOTES**

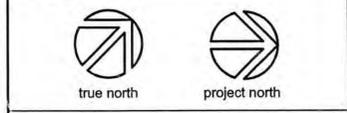
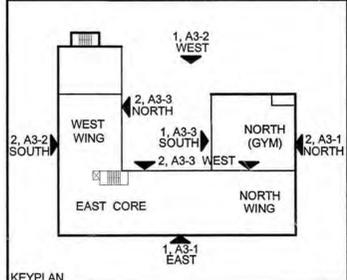
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**ROOM SCHEDULE**

- 101 G-P ROOM
- 102 DINING ROOM
- 103 SERVERY
- 104 OFFICE
- 105 KITCHEN SERVERY
- 106 OFFICE
- 107 KITCHEN
- 108 KITCHEN PREP
- 109 DISHWASHING
- 110 DRY STORAGE
- 111 OFFICE
- 112 FOOD SERVICE OFFICE
- 113 CORRIDOR
- 114 OFFICE
- 115 OFFICE
- 116 STORAGE
- 117 COOLER
- 118 FREEZER
- 119 DRY STORAGE
- 121 OFFICE
- 122 WASHROOM
- 123 WASHROOM
- 124 DAYCARE (KITCHEN)
- 125 INTERVIEW ROOM
- 126 CORRIDOR
- 127 STAIR
- 128 STORAGE
- 129 STORAGE
- 130 RECEPTION AREA
- 131 INTERVIEW ROOM
- 132 OFFICE
- 133 INTERVIEW ROOM
- 134 CORRIDOR
- 135 VESTIBULE
- 136 DAYCARE
- 137 DAYCARE (WASHROOM)
- 138 DAYCARE
- 139 DAYCARE STORAGE



*What's happening with the staircase & opening up the area?*

FEB 28/06 ISSUED FOR BUILDING PERMIT

date: \_\_\_\_\_ revisions: \_\_\_\_\_

customer: **YWCA**  
84 FREDERICK STREET  
KITCHENER, ONTARIO

project: **YWCA RENEWAL**

title: **GROUND FLOOR DEMOLITION PLAN**

**THE walterfedy PARTNERSHIP**  
ARCHITECTS • ENGINEERS  
546 Belmont Ave. W., Kitchener, Ontario, N2M 5E3  
P: 519-576-2150 F: 519-576-5499 www.wtrp.com

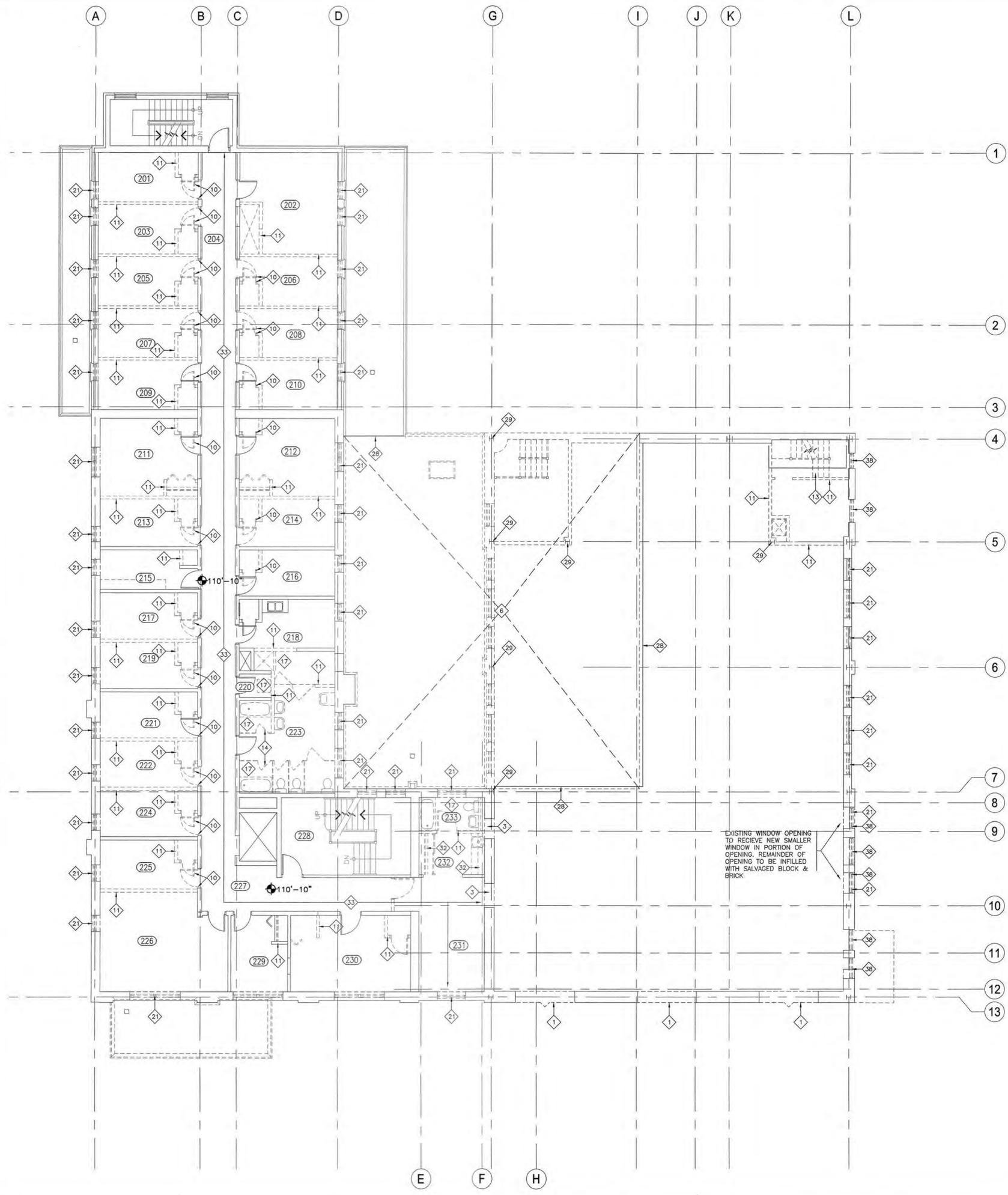
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scale: 1/8"=1'-0"  
date: FEB 28/06  
job no.: 2004-0439-10  
CAD file: A1-2\_2004043910  
drawn by: SR, JS  
checked by: \_\_\_\_\_

BCR: \_\_\_\_\_  
sheet no.: \_\_\_\_\_

**A1-4**





**DEMOLITION NOTES**

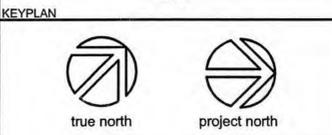
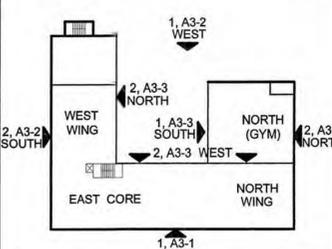
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- (202) BEDROOM (2P)
- (203) BEDROOM (1P)
- (204) CORRIDOR
- (205) BEDROOM (1P)
- (206) BEDROOM (1P)
- (207) BEDROOM (1P)
- (208) BEDROOM (1P)
- (209) BEDROOM (1P)
- (210) BEDROOM (1P)
- (211) BEDROOM (2P)
- (212) BEDROOM (2P)
- (213) BEDROOM (1P)
- (214) BEDROOM (1P)
- (215) LINEN STORAGE
- (216) BEDROOM (1P)
- (217) BEDROOM (1P)
- (218) LAUNDRY
- (219) BEDROOM (1P)
- (220) JANITOR
- (221) BEDROOM (1P)
- (222) BEDROOM (1P)
- (223) WASHROOM
- (224) WASHROOM (1P)
- (225) BEDROOM (1P)
- (226) LOUNGE
- (227) CORRIDOR
- (228) STAIR
- (229) BEDROOM (1P)
- (230) BEDROOM (2P)
- (231) BEDROOM (2P)
- (232) CLOSET
- (233) WASHROOM



FEB 28/06 ISSUED FOR BUILDING PERMIT

date revisions

customer  
**YWCA**  
**84 FREDERICK STREET**  
**KITCHENER, ONTARIO**

project  
**YWCA RENEWAL**  
**84 FREDERICK STREET**  
**KITCHENER, ONTARIO**

title  
**SECOND FLOOR**  
**DEMOLITION PLAN**



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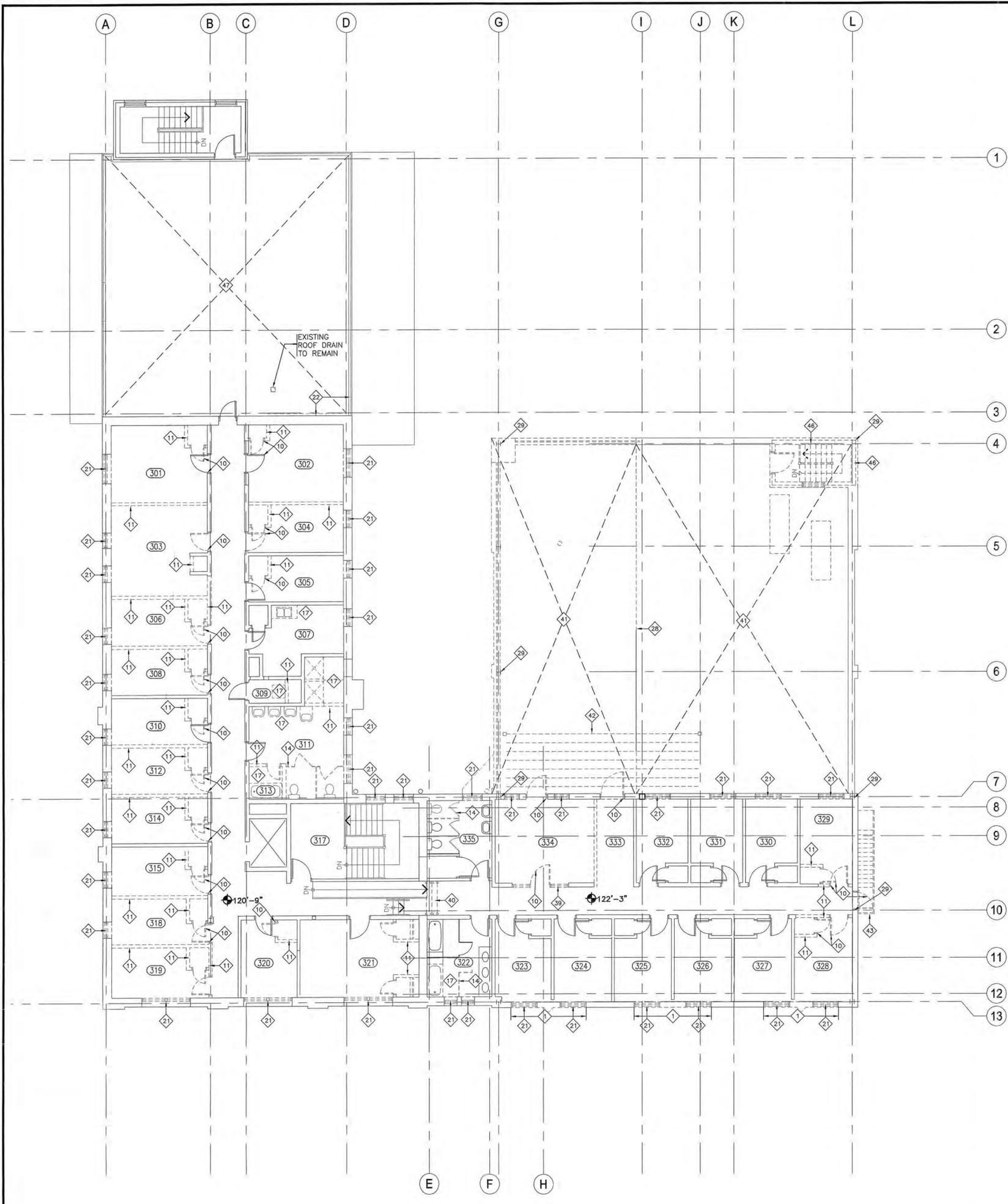
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job no.: 2004-0433-10  
CAD file: A1-3\_2004043310  
drawn by: SR  
checked by:

sheet no.:  
**A1-5**



**DEMOLITION NOTES**

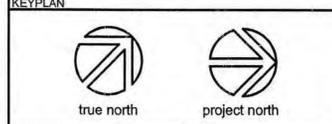
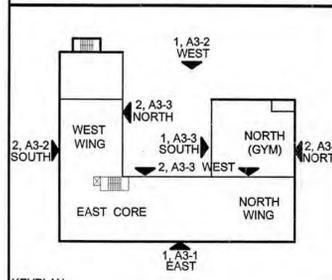
- 1 SAW-CUT FACE BRICK AND BACK-UP BLOCK OR TOOTH-OUT AS REQUIRED. SALVAGE BRICK AND BLOCK FOR PROJECT USE AS REQUIRED. FORM NEW OPENING IN EXISTING CAVITY WALL TO PLAN DIMENSION SHOWN. EXTERIOR WYTHE SHALL HAVE TOOTHED-IN JOISTS. INTERIOR WYTHE SHALL BE SAW-CUT. REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR ELEVATION OF OPENING AND LINTEL TYPE.
- 14 AS NOTE 1 BUT BOTH WYTHE SAW-CUT.
- 2 TEMPORARY OPENING EXISTS. FORM NEW OPENING IN EXISTING CAVITY WALL TO PLAN DIMENSION SHOWN USING TOOTHED JOISTS. HAND OVER TEMPORARY LINTEL TO PROJECT MANAGER.
- 3 FORM NEW OPENING IN EXISTING WALL TO PLAN DIMENSION SHOWN USING TOOTHED JOISTS. MASONRY SHALL BE OF SALVAGED OR NEW MATERIAL TO MATCH EXISTING. REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR ELEVATION OF OPENING AND STRUCTURAL SUPPORT. DISPOSE OF ALL UNWANTED MATERIAL.
- 4 CAREFULLY REMOVE FACING BRICK AND CONCRETE COPING STONES AND SALVAGE FOR USE AS REQUIRED. REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR SCOPE OF REMOVAL AND NEW WORK. DISPOSE OF ALL UNWANTED MATERIAL.
- 5 REMOVE AND DISPOSE OF WINDOW ASSEMBLY AS APPLICABLE. CAREFULLY SAW-CUT FACING BRICK BETWEEN WINDOW SILL AND (NEW) FLOOR BELOW, AND SALVAGE FOR PROJECT USE AS REQUIRED. FORM NEW FULL-HEIGHT OPENING. EXTERIOR WYTHE (FACE BRICK) SHALL HAVE TOOTHED-IN JOISTS. INTERIOR WYTHE (CONC. BLOCK) SHALL BE SAW-CUT. MASONRY SHALL BE OF MATERIAL AND THICKNESS TO MATCH EXISTING. DISPOSE OF ALL UNWANTED MATERIAL.
- 6 REMOVE ENTIRE BUILDING IN THIS AREA. FROM ROOF TO GROUND FLOOR LEAVE BASEMENT WALLS INTACT. TO RECEIVE NEW ROOF STRUCTURE. PATCH AND MAKE GOOD.
- 7 TEMPORARY OPENING EXISTS. HAND OVER TEMPORARY LINTEL TO PROJECT MANAGER.
- 8 REMOVE VENT GRILLE AND LOUVRE AND DISPOSE OF.
- 9 CUT 7'-0" HIGH OPENING FOR TEMPORARY ACCESS. INSTALL SECURITY DOOR AND FRAME
- 10 REMOVE COMPLETE DOOR AND FRAME ASSEMBLY AND MOVE TO STORAGE FOR RE-USE. LINTEL TO REMAIN
- 11 REMOVE EXISTING INTERIOR WALL ASSEMBLY, AND DISPOSE OF UNWANTED MATERIAL IN SEPARATE MATERIAL BINS.
- 12 REMOVE AND DISPOSE OF FIRE HOSE CABINET.
- 13 REMOVE EXISTING STAIRWELL IN ITS ENTIRETY, INCLUDING EXTERIOR WALLS, WINDOWS, ROOF, STAIR, AND SLAB. (FOUNDATIONS TO BE CUT DOWN TO 12" BELOW GRADE).
- 14 CAREFULLY REMOVE MOVEABLE PARTITION ASSEMBLY, GUIDE RAILS AND MOTORS. HAND OVER TO OWNER OR DISPOSE OF IF NOT REQUIRED.
- 15 CONCRETE FOUNDATION WALL TO BE SAW-CUT TO BELOW EXISTING CONCRETE FLOOR SLAB, OR OTHERWISE SIZE NOTED.
- 16 REMOVE AND DISPOSE OF DRINKING FOUNTAIN.
- 17 WHERE EXISTING PLUMBING FIXTURES ARE REMOVED, REPAIR CONCRETE SLAB.
- 18 REMOVE UPPER SECTION OF FOUNDATION WALL, EXPOSED CONCRETE STRUCTURE, AREA WELL GRILLES ETC. TO ENABLE NEW CONCRETE SLAB TO BE CONSTRUCTED. REFER TO STRUCTURAL AND ARCHITECTURAL DRAWINGS FOR INTENT.
- 19 REMOVE EXISTING CONC. STAIRS, CANOPY, PLANTERS AND MISC. ITEMS INCLUDING HANDRAILS. CUT FOUNDATIONS DOWN TO MIN. 12" BELOW FINISHED GRADE EXCEPT REMOVE ENTIRELY WHERE NEW FOOTINGS ARE REQUIRED. STOCKPILE PAVING STONES FOR RE-USE
- 20 REMOVE EXISTING CONCRETE SLAB.
- 21 CAREFULLY REMOVE AND DISPOSE OF EXISTING WINDOW ASSEMBLY, MAKE GOOD ADJACENT SURFACES TO ACCEPT NEW WINDOW. LINTEL TO REMAIN.
- 22 REMOVE PARAPET FOR NEW MECHANICAL ROOM. REFER TO DRAWING ?/A5-1 FOR DETAIL AND TO ROOF PLAN A2-5.
- 23 REMOVE EXISTING BULKHEAD. REFER TO REFLECTED CEILING PLANS FOR NEW LAYOUT.
- 24 EXISTING WOOD SPRUNG FLOOR SYSTEM TO BE SALVAGED FOR RE-USE.
- 25 EXISTING WOOD FLOORING TO BE SALVAGED FOR RE-USE
- 26 SAWCUT EXISTING CONCRETE FOUNDATION WALL TO FORM NEW OPENING IN EXISTING WALL.
- 27 REMOVE EXISTING WALL FINISHES (PLASTER, GYP. BD., ETC.). REPAIR EXISTING FACE OF CONCRETE WALL & PREP. SURFACE TO RECEIVE WATERPROOFING.
- 28 SAWCUT EXISTING CONCRETE SLAB TO ALLOW FOR INSTALLATION OF FOOTINGS/NEW SERVICES AS REQUIRED. (REFER TO STRUCTURAL AND MECHANICAL DRAWINGS FOR NEW WORK).
- 29 LINE OF BUILDING CUT THROUGH ALL ASSEMBLIES - ROOF, WALLS, FLOORS INCLUDING ALL FINISH MATERIALS AND SURFACES.
- 30 EXISTING STRUCTURAL SUPPORTS TO BE PROTECTED DURING DEMOLITION PROCESS.
- 31 EXISTING CUBBIES TO BE HANDED OVER TO OWNER FOR RELOCATION.
- 32 EXISTING FLOORING TO BE REMOVED C/W ADHESIVE.
- 33 EXISTING MILLWORK TO BE REMOVED.
- 34 EXISTING VCT OR VAT FLOOR FINISH TO BE REMOVED.
- 35 EXISTING FRIDGE, FREEZER C/W SHELVING, AND ALL KITCHEN EQUIPMENT DESIGNATED \* TO BE REMOVED FOR REUSE IN NEW KITCHEN. REMAINDER OF STAINLESS STEEL TO BE REMOVED AND SOLD FOR RECYCLING OR REUSE.
- 36 EXISTING MIRROR TO BE REMOVED FOR RECYCLING IN USABLE CONDITION.
- 37 REMOVE PARTITIONS AND ALL BUILT-INS IN DAYCARE SPACE
- 38 REMOVE EXISTING STAGE C/W WITH STAIRS AND MISC.
- 39 REMOVE AND DISPOSE OF EXISTING WINDOW ASSEMBLY, PATCH AND MAKE GOOD EXISTING OPENING WITH SALVAGED BLOCK & BRICK.
- 40 CAREFULLY REMOVE EXISTING DOOR/WINDOW PARTITION.
- 41 REMOVE EXISTING STAIR. PATCH AND MAKE GOOD ALL DAMAGED AREAS
- 42 REMOVE EXISTING ROOF ASSEMBLY DOWN TO CONCRETE DECK. REFER TO ROOF PLAN A2-5 FOR EXTENT OF WORK
- 43 REMOVE AND DISPOSE OF EXISTING WOOD TRELLIS
- 44 REMOVE EXISTING FIRE ESCAPE. HAND OVER TO OWNER OR DISPOSE OF IF NOT REQUIRED.
- 45 REMOVE EXISTING HANDRAIL. EXISTING STAIR TO REMAIN.
- 46 REMOVE EXISTING CEILING SYSTEM, AND FLOOR STRUCTURE ABOVE, TO RECEIVE NEW STRUCTURE. REFER TO STRUCTURAL FOR EXTENT OF WORK.
- 47 REMOVE EXISTING STAIR WELL C/W EXTERIOR AND INTERIOR WALLS, ROOF ASSEMBLY AND STAIR SYSTEM. BASEMENT TO REMAIN. PATCH AND MAKE GOOD. REFER TO STRUCTURAL FOR INFILL OF EXISTING ROOF STRUCTURE. REFER TO ROOF PLAN A2-5 FOR ROOF ASSEMBLY. RE-BUILD PARAPET. MATCH EXISTING HEIGHT AND WIDTH OF NON-COMBUSTIBLE MATERIAL ONLY. ROOF INFILL TO BE FLUSH WITH EXISTING.
- 48 EXISTING ROOF GARDEN TO REMAIN AND TO BE PROTECTED DURING CONSTRUCTION PERIOD.

**GENERAL NOTES:**

- 1) THE WALTER FEDY PARTNERSHIP LETTER REPORT OF FEBRUARY 27, 2006 (SECTION 1200) TO BE READ IN CONJUNCTION WITH THESE DRAWINGS.
- 2) CONTRACTOR IS RESPONSIBLE FOR PROVIDING PROTECTION OF EXISTING FLOORING TO REMAIN DURING CONSTRUCTION. SPECIAL CARE TO BE TAKEN W/ HARDWOOD FLOORS.
- 3) REFER TO ELECTRICAL SPECIFICATIONS FOR SCHEDULE & DETAILS OF REMOVAL & REINSTALLATION OF EXISTING LIGHTING FIXTURES.
- 4) REFER TO MECHANICAL SPECIFICATIONS FOR DETAILS OF REMOVAL OF EXISTING MECHANICAL SYSTEMS.
- 5) REFER TO STRUCTURAL DRAWINGS FOR AREAS & EXTENT OF REMOVAL OF EXISTING STRUCTURAL ELEMENTS.
- 6) CONTRACTOR IS RESPONSIBLE FOR REPAIR TO ADJACENT WORK DAMAGED BY DEMOLITION WORK.
- 7) ALL WORK TO BE DONE IN PHASES, TO MINIMIZE DISRUPTION TO OCCUPANTS. REFER TO PHASING PLAN A1-2.
- 8) SEPARATE MASONRY REMOVALS FOR CRUSHING AND USE AS ON-SITE FILL. DISPOSE OF ORGANICS, DRYWALL, AND TIMBER IN SEPARATE BINS FOR RECYCLING.
- 9) SALVAGE ALL BRICK VENEER, CLEAN MORTAR, STACK & STORE ON SITE FOR REUSE.

**ROOM LEGEND**

- 301 STAIR NO. 2
- 302 MECHANICAL ROOM
- 303 BEDROOM (2P)
- 304 BEDROOM (2P)
- 305 LAUNDRY
- 306 BEDROOM (2P)
- 307 HOUSEKEEPING
- 308 JANITOR
- 309 BEDROOM (4P)
- 310 BEDROOM (2P)
- 311 BEDROOM (4P)
- 312 QUIET ROOM
- 313 STAIR NO.1
- 314 BEDROOM (2P)
- 315 WASHROOM
- 316 BATHROOM
- 317 LOUNGE
- 318 BEDROOM (1P)
- 319 CORRIDOR
- 320 BEDROOM (1P)
- 321 BEDROOM (1P)
- 322 BEDROOM (1P)
- 323 BEDROOM (1P)
- 324 BEDROOM (1P)
- 325 BEDROOM (1P)
- 326 BEDROOM (1P)
- 327 BEDROOM (1P)
- 328 BEDROOM (1P)
- 329 STAIR NO. 3
- 330 BEDROOM (1P)
- 331 BEDROOM (1P)
- 332 BEDROOM (1P)
- 333 BEDROOM (1P)
- 334 RESIDENT LOUNGE
- 335 WASHROOM
- 336 CORRIDOR



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customer	
<b>YWCA</b> <b>84 FREDERICK STREET</b> <b>KITCHENER, ONTARIO</b>	
project	<b>YWCA RENEWAL</b> <b>84 FREDERICK STREET</b> <b>KITCHENER, ONTARIO</b>
title	<b>THIRD FLOOR</b> <b>DEMOLITION PLAN</b>

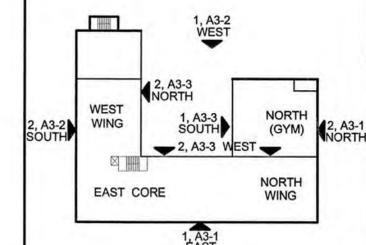
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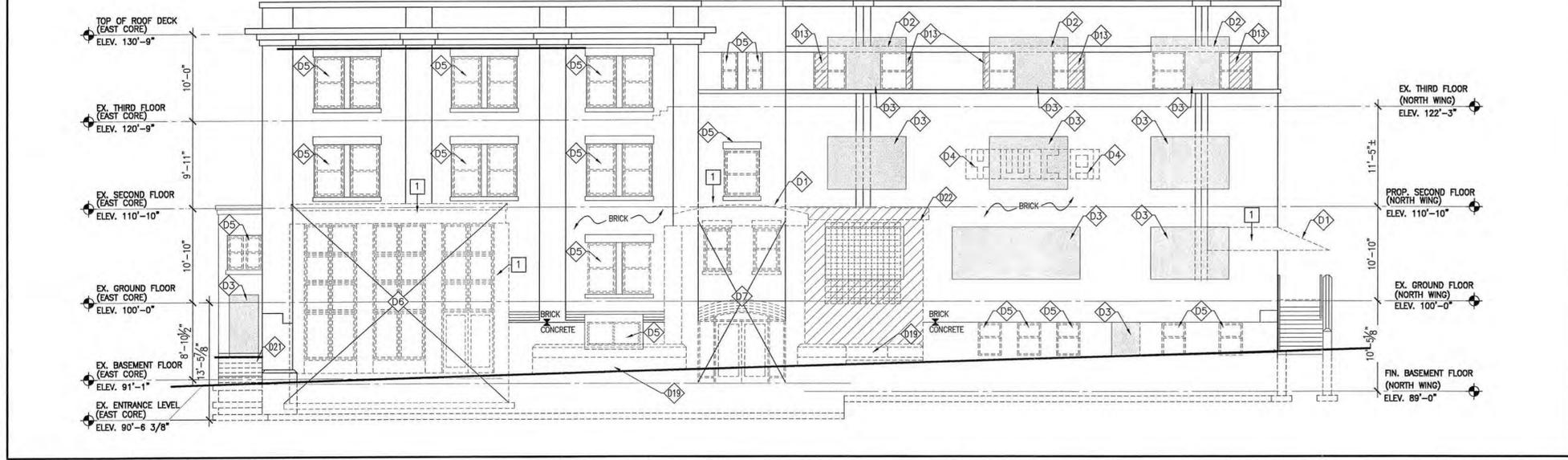
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 checked by:

BCR:  
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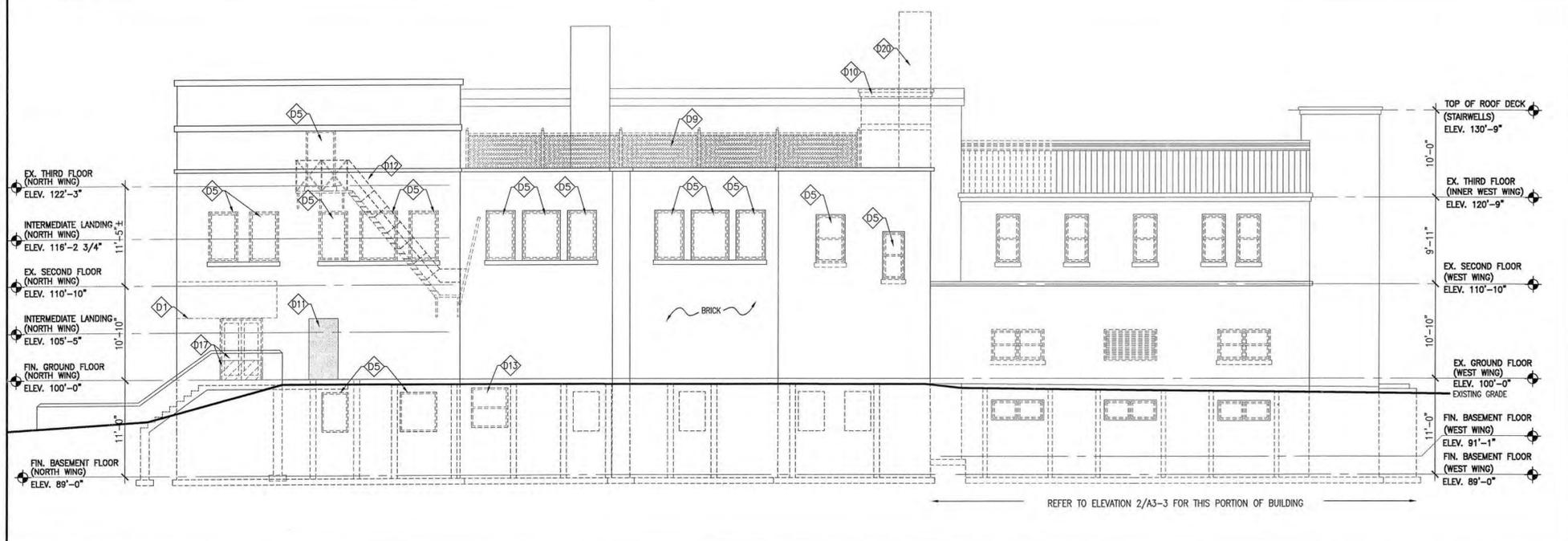
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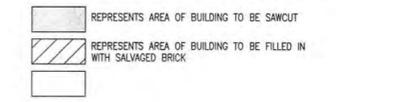


**1 EAST ELEVATION - FREDERICK STREET**  
A1-7 1/8"=1'-0"



**2 NORTH ELEVATION**  
A1-7 1/8"=1'-0"

- GENERAL NOTES:**
- SEVERELY DAMAGED BRICK TO BE REPLACED. TOOTH IN, PATCH AND MAKE GOOD ALL EXISTING SURFACES TO REMAIN.
  - NEW WINDOWS TO REPLACE EXISTING, IN EXISTING OPENINGS
  - CONTRACTOR TO REMOVE EXISTING WINDOWS WITH PRECAUTION NOT TO DAMAGE EXISTING BRICK VENEER, STONE SILLS AND HEADERS, BRICK SILLS, BRICK VOUSSOIRS, AND PRECAST BANDING DURING DEMOLITION
  - REMOVE GRATING, DEBRIS, AND GRAVEL FOR NEW WINDOWS. REINSTALL GRATES IN GOOD CONDITION.
  - NO WORK DONE IN THIS AREA
- DEMOLITION NOTES:**
- THE WALTER FEDY PARTNERSHIP DEMOLITION LETTER REPORT OF FEBRUARY 27, 2006 TO BE READ IN CONJUNCTION WITH THESE DRAWINGS.
- REMOVE EXISTING CANOPY ASSEMBLY C/W MISC. ANCHORS FROM STRUCTURE. PATCH AND REPAIR ALL DAMAGED BRICK VENEER
  - SAW CUT AND REMOVE EXISTING PRECAST BANDING TO ACCOMMODATE NEW BAY WINDOWS. (REFER TO ARCHITECTURAL DRAWINGS)
  - SAW CUT AND REMOVE EXISTING WALL ASSEMBLY TO ALLOW FOR INSTALLATION OF NEW WINDOW AND/OR DOOR. PROVIDE FLASHING TO NEW A/V BARRIER; BUILD NEW JAMBS WITH SALVAGED BRICK
  - EXISTING GLASS BLOCK TO BE REMOVED. PATCH AND MAKE GOOD ALL DAMAGED AREAS, USE SALVAGED BRICK.
  - CAREFULLY REMOVE EXISTING WINDOW UNIT, C/W MISC. FASTENERS, METAL SILLS, SHIMS AND SEALANTS.
  - REMOVE EXISTING STAIRWELL IN ITS ENTIRETY, INCLUDING EXTERIOR WALLS, WINDOWS, ROOF, STAIR, AND SLAB. (FOUNDATIONS TO BE CUT DOWN TO 12" BELOW GRADE).
  - REMOVE AND DISPOSE EXISTING WALL ASSEMBLY INCLUDING EXISTING ENTRANCE AND WINDOW ASSEMBLY C/W STONE SILL AND HEADER. BASEMENT AND GROUND FLOOR ONLY. REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR LAYOUT. CLEAN AND STORE EXISTING BRICK FOR LATER RE-INSTALLATION.
  - REMOVE EXISTING LOUVER, C/W MISC. FASTENERS, METAL SILLS, SHIMS AND SEALANTS. PATCH AND MAKE GOOD, TO RECEIVE NEW DOOR C/W FRAME, FASTENERS ETC.
  - REMOVE EXISTING PORTION OF FENCE. PATCH AND MAKE GOOD ALL EXISTING SURFACES TO REMAIN.
  - REMOVE EXISTING STAIRWELL. PATCH AND MAKE GOOD ROOF. CLEAN AND STORE EXISTING BRICK FOR LATER RE-INSTALLATION.
  - SAW CUT AND REMOVE EXISTING WALL ASSEMBLY TO ALLOW FOR INSTALLATION OF NEW DOOR
  - REMOVE AND DISPOSE EXISTING FIRE ESCAPE INCLUDING ALL FASTENERS. PATCH AND MAKE GOOD ALL DAMAGED AREAS.
  - REMOVE AND DISPOSE EXISTING WINDOW AND FRAME, CLOSE IN, TO MATCH EXISTING CONDITION
  - RESERVED
  - RESERVED
  - PATCH WITH SALVAGED BRICK EXISTING WALL DAMAGED BY DEMOLITION
  - REMOVE AND DISPOSE EXISTING DOOR AND FRAME. PATCH AND MAKE GOOD ALL DAMAGED AREAS FILL IN OPENING FOR NEW WINDOW AS REQUIRED (REFER TO ARCHITECTURAL DRAWINGS FOR NEW LAYOUT). USE SALVAGED BRICK.
  - RESERVED
  - REMOVE AND DISPOSE OF EXISTING CONCRETE PLANTERS
  - REMOVE EXISTING CHIMNEY. CLEAN EXISTING BRICK CRACK AND STORE FOR LATER RE-INSTALLATION
  - REMOVE EXISTING CONCRETE STAIRS C/W FOUNDATIONS FILL IN WITH ????????
  - REMOVE PARAPET. REFER TO DRAWING 2/A3-1 FOR DETAIL.



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FEB 03/06	ISSUED FOR SITE PLAN APPROVAL
date	revisions
customer	
<b>YWCA</b> <b>84 FREDERICK STREET</b> <b>KITCHENER, ONTARIO</b>	
project	
<b>YWCA RENEWAL</b> <b>84 FREDERICK STREET</b> <b>KITCHENER, ONTARIO</b>	
title	
<b>DEMOLITION</b> <b>BUILDING ELEVATION</b>	

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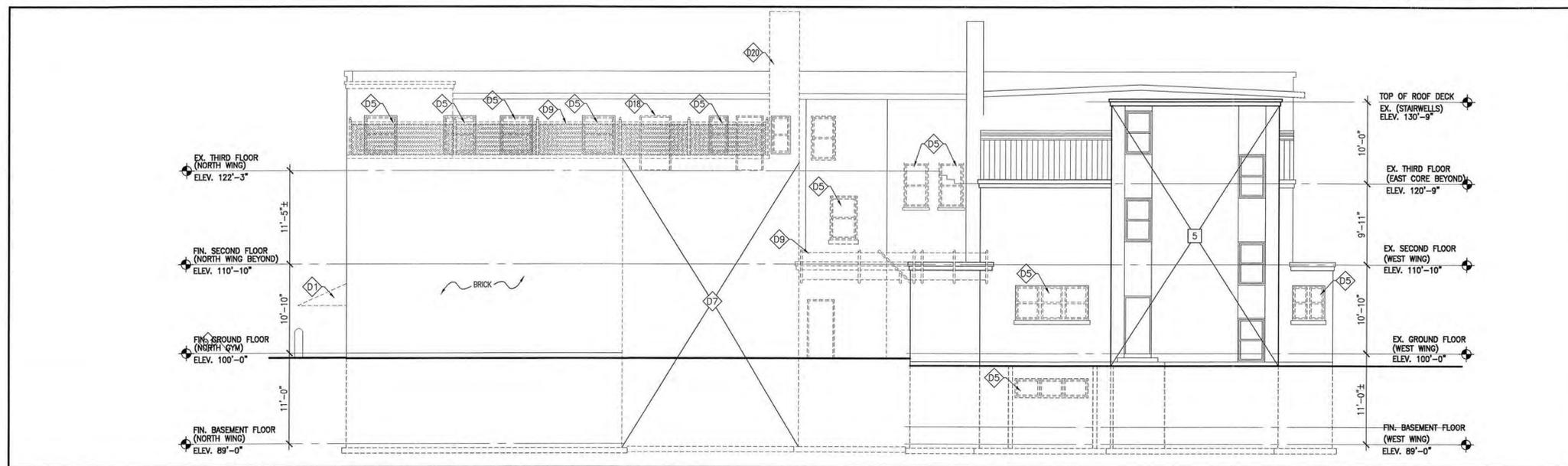
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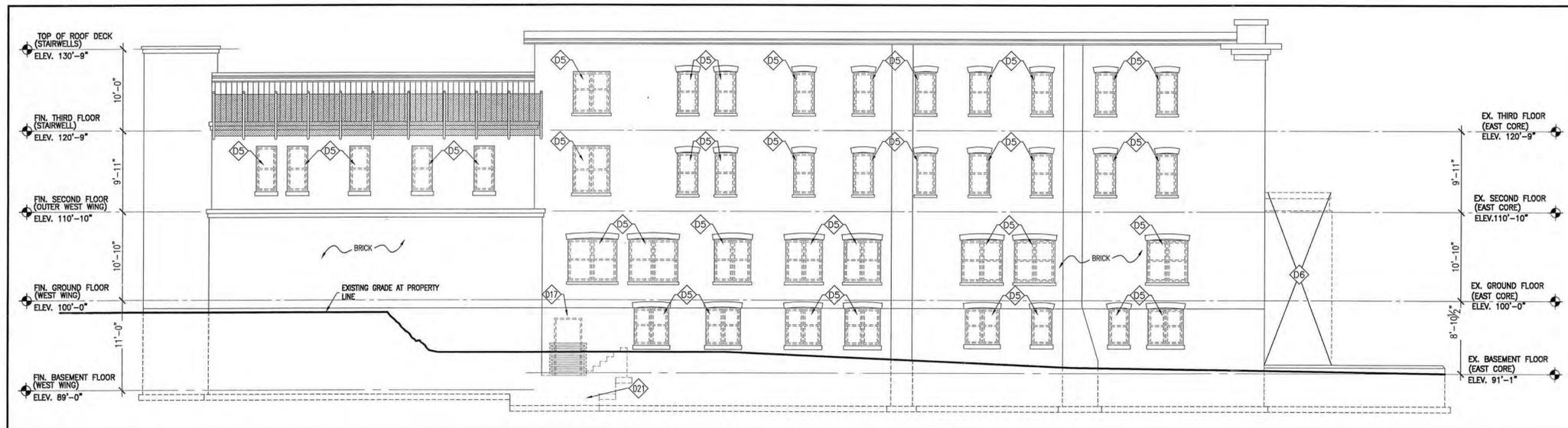
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checked by:

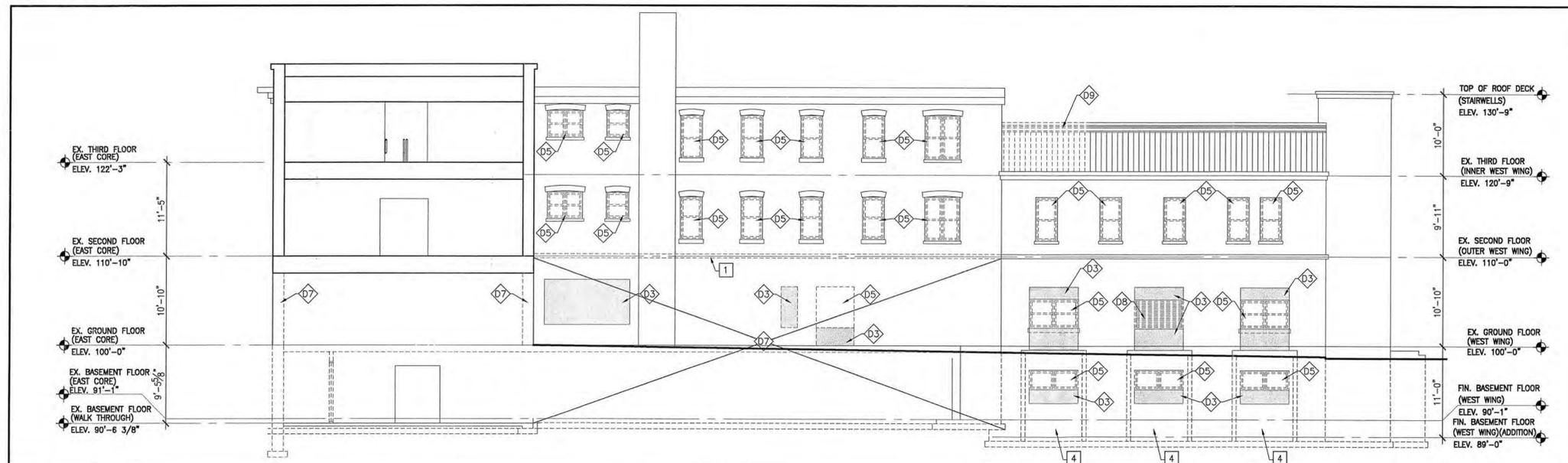
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sheet no.:  
**A1-7**



1 WEST ELEVATION  
A1-8 1/8"=1'-0"



2 SOUTH ELEVATION  
A1-8 1/8"=1'-0"



2 SOUTH ELEVATION  
A1-8 1/8"=1'-0"

GENERAL NOTES:

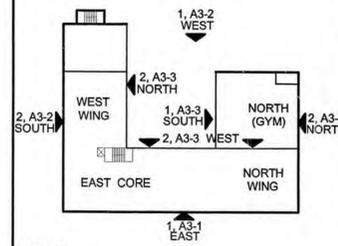
- 1 SEVERELY DAMAGED BRICK TO BE REPLACED, TOOTH IN, PATCH AND MAKE GOOD ALL EXISTING SURFACES TO REMAIN.
- 2 NEW WINDOWS TO REPLACE EXISTING, IN EXISTING OPENINGS
- 3 CONTRACTOR TO REMOVE EXISTING WINDOWS WITH PRECAUTION NOT TO DAMAGE EXISTING BRICK VENEER, STONE SILLS AND HEADERS, BRICK SILLS, BRICK VOUSOIRS, AND PRECAST BANDING DURING DEMOLITION
- 4 REMOVE GRATING, DEBRIS, AND GRAVEL FOR NEW WINDOWS. REINSTALL GRATES IN GOOD CONDITION.
- 5 NO WORK DONE IN THIS AREA

DEMOLITION NOTES:

THE WALTER FEDY PARTNERSHIP DEMOLITION LETTER REPORT OF FEBRUARY 27, 2006 TO BE READ IN CONJUNCTION WITH THESE DRAWINGS.

- D1 REMOVE EXISTING CANOPY ASSEMBLY C/W MISC. ANCHORS FROM STRUCTURE. PATCH AND REPAIR ALL DAMAGED BRICK VENEER
- D2 SAW CUT AND REMOVE EXISTING PRECAST BANDING TO ACCOMMODATE NEW BAY WINDOWS. (REFER TO ARCHITECTURAL DRAWINGS)
- D3 SAW CUT AND REMOVE EXISTING WALL ASSEMBLY TO ALLOW FOR INSTALLATION OF NEW WINDOW AND/OR DOOR. PROVIDE FLASHING TO NEW A/V BARRIER; BUILD NEW JAMBS WITH SALVAGED BRICK
- D4 EXISTING GLASS BLOCK TO BE REMOVED. PATCH AND MAKE GOOD ALL DAMAGED AREAS. USE SALVAGED BRICK.
- D5 CAREFULLY REMOVE EXISTING WINDOW UNIT, C/W MISC. FASTENERS, METAL SILLS, SHIMS AND SEALANTS.
- D6 REMOVE EXISTING STAIRWELL IN ITS ENTIRETY, INCLUDING EXTERIOR WALLS, WINDOWS, ROOF, STAIR, AND SLAB. (FOUNDATIONS TO BE CUT DOWN TO 12" BELOW GRADE).
- D7 REMOVE AND DISPOSE EXISTING WALL ASSEMBLY INCLUDING EXISTING ENTRANCE AND WINDOW ASSEMBLY C/W STONE SILL AND HEADER. BASEMENT AND GROUND FLOOR ONLY. REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR LAYOUT. CLEAN AND STORE EXISTING BRICK FOR LATER RE-INSTALLATION.
- D8 REMOVE EXISTING LOUVRE, C/W MISC. FASTENERS, METAL SILLS, SHIMS AND SEALANTS. PATCH AND MAKE GOOD, TO RECEIVE NEW DOOR C/W FRAME, FASTENERS ETC.
- D9 REMOVE EXISTING PORTION OF FENCE. PATCH AND MAKE GOOD ALL EXISTING SURFACES TO REMAIN.
- D10 REMOVE EXISTING STAIRWELL. PATCH AND MAKE GOOD ROOF. CLEAN AND STORE EXISTING BRICK FOR LATER RE-INSTALLATION.
- D11 SAW CUT AND REMOVE EXISTING WALL ASSEMBLY TO ALLOW FOR INSTALLATION OF NEW DOOR
- D12 REMOVE AND DISPOSE EXISTING FIRE ESCAPE INCLUDING ALL FASTENERS. PATCH AND MAKE GOOD ALL DAMAGED AREAS.
- D13 REMOVE AND DISPOSE EXISTING WINDOW AND FRAME. CLOSE IN, TO MATCH EXISTING CONDITION
- D14 RESERVED
- D15 RESERVED
- D16 PATCH WITH SALVAGED BRICK EXISTING WALL DAMAGED BY DEMOLITION
- D17 REMOVE AND DISPOSE EXISTING DOOR AND FRAME. PATCH AND MAKE GOOD ALL DAMAGED AREAS FILL IN OPENING FOR NEW WINDOW AS REQUIRED (REFER TO ARCHITECTURAL DRAWINGS FOR NEW LAYOUT). USE SALVAGED BRICK.
- D18 RESERVED
- D19 REMOVE AND DISPOSE OF EXISTING CONCRETE PLANTERS
- D20 REMOVE EXISTING CHIMNEY. CLEAN EXISTING BRICK GRACK AND STORE FOR LATER RE-INSTALLATION.
- D21 REMOVE EXISTING CONCRETE STAIRS C/W FOUNDATIONS FILL IN WITH ????????
- D22 REMOVE PARAPET. REFER TO DRAWING ?/A5-1 FOR DETAIL.

- REPRESENTS AREA OF BUILDING TO BE SAWCUT
- REPRESENTS AREA OF BUILDING TO BE FILLED IN WITH SALVAGED BRICK



KEYPLAN

FEB 28/06 ISSUED FOR BUILDING PERMIT  
FEB 03/06 ISSUED FOR SITE PLAN APPROVAL

customer  
**YWCA RENEWAL**  
84 FREDERICK STREET  
KITCHENER, ONTARIO

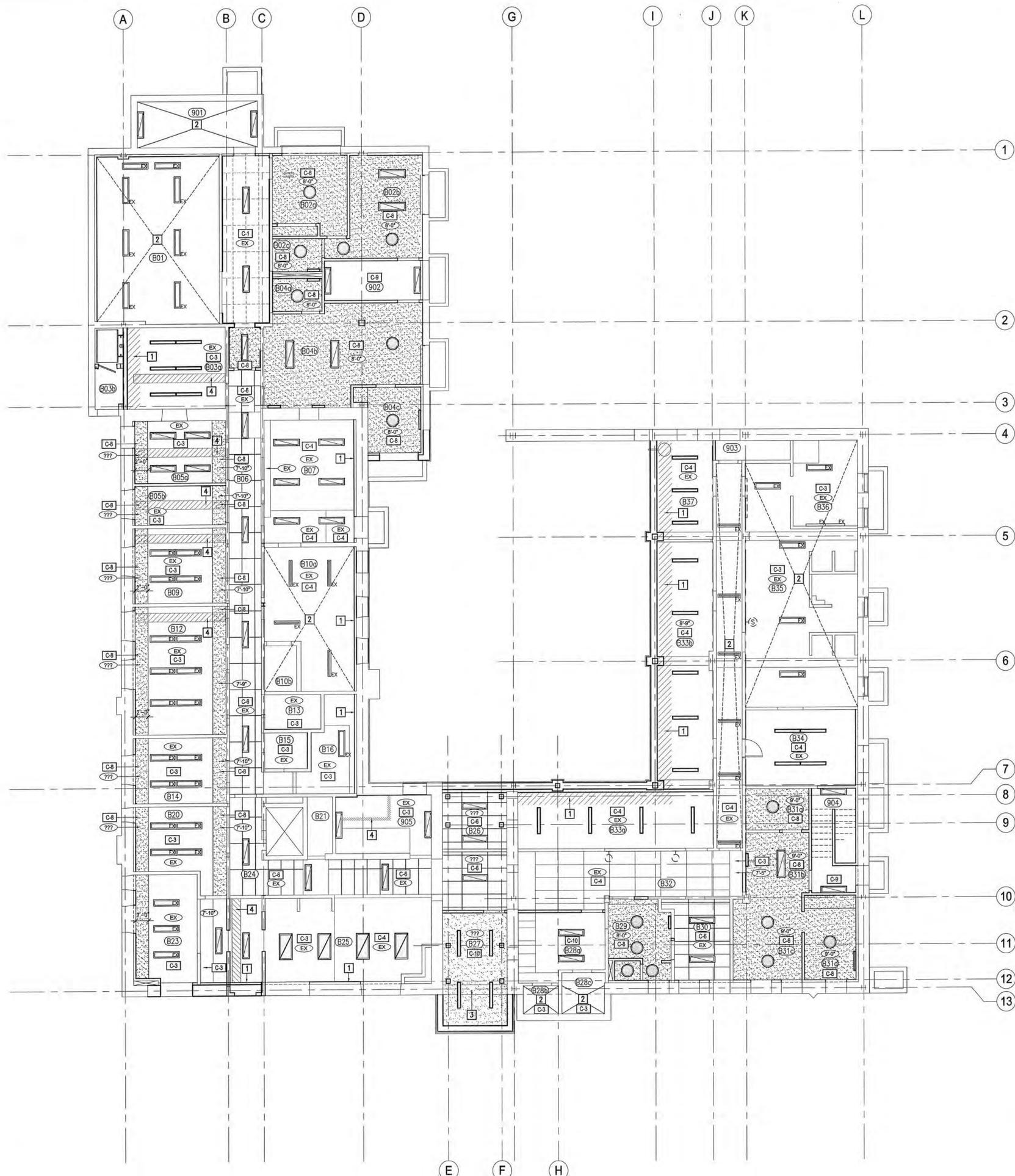
project  
title  
**DEMOLITION**  
BUILDING ELEVATIONS

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drawn by: SR, JE  
checked by:  
sheet no.: **A1-8**



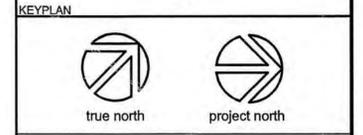
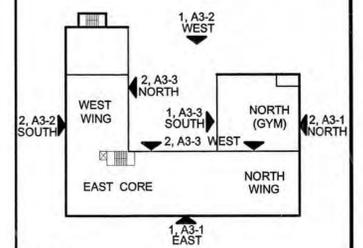
- ROOM SCHEDULE**
- (901) MEETING ROOM
  - (902) TRANSITIONAL UNIT 1 (BEDROOM)
  - (902b) TRANSITIONAL UNIT 1 (KITCHEN/LIVING)
  - (903) MECHANICAL ROOM
  - (903b) LIFT ROOM
  - (904) TRANSITIONAL UNIT 2 (BATHROOM)
  - (904b) TRANSITIONAL UNIT 2 (KITCHEN/LIVING)
  - (904c) TRANSITIONAL UNIT 2 (BEDROOM)
  - (905) STUDENTS OFFICE
  - (905b) COPY ROOM
  - (906) CORRIDOR
  - (907) STAFF ROOM
  - (909) OFFICE
  - (910) MAINTENANCE ROOM
  - (910b) ELEVATOR SERVICE ROOM
  - (912) VOLUNTEER COORDINATOR AND C OF F OFFICE
  - (913) MENS WASHROOM
  - (914) OFFICE
  - (915) BARRIER FREE WASHROOM
  - (916) WOMENS WASHROOM
  - (920) OFFICE
  - (921) SECURITY EQUIPMENT
  - (923) MANAGERS OFFICE
  - (924) CORRIDOR
  - (925) GENERAL OFFICE
  - (926) MEETING ROOM
  - (927) MECHANICAL ROOM
  - (928a) ELECTRICAL ROOM
  - (928b) ELECTRICAL ROOM
  - (928c) ELECTRICAL ROOM
  - (929) WASHROOM
  - (930) NURSE STATION
  - (931a) TRANSITIONAL UNIT 3 (WASHROOM)
  - (931b) TRANSITIONAL UNIT 3 (KITCHEN)
  - (931c) TRANSITIONAL UNIT 3 (LIVING ROOM)
  - (931d) TRANSITIONAL UNIT 3 (BEDROOM)
  - (932) CORRIDOR
  - (933a) STORAGE
  - (933b) STORAGE
  - (934) STORAGE
  - (935) SHOWER ROOM
  - (936) WASHROOM
  - (937) UNASSIGNED
  - (901) EXIT STAIR
  - (902) EXIT STAIR
  - (903) EXIT STAIR
  - (904) EXIT STAIR
  - (905) COMMUNICATION STAIR

- GENERAL NOTES**
1. FILL ALL HOLES THROUGH EXISTING FIRE RATED WALL OR FLOOR ASSEMBLIES AFTER REMOVAL OF EXISTING ELECTRICAL AND MECHANICAL SERVICES. FILL OPENINGS WITH CONCRETE AND OR FIRE STOPPING AS REQUIRED BY CODE.
  2. PATCH AND REPAIR EXISTING PLASTER AND OR GYPSUM BOARD CEILING TO ENSURE 1HR FLOOR TO FLOOR/ROOF FIRE RESISTANCE RATING. PAINT FINISH GRADE.
  3. CONTRACTOR TO VERIFY ALL DIMENSIONS ON SITE AND MAKE MODIFICATIONS TO SUIT EXISTING SITE CONDITIONS.
  4. WHERE BULKHEAD FACE IS BELOW WINDOW HEAD, PROVIDE FINISHED DRYWALL SURFACE TO BULKHEAD IN WINDOW. (TYP)

- CEILING TYPE LEGEND**
- FOR EXTENT OF CEILING WORK CO-ORDINATE WITH DEMOLITION DRAWINGS. REMOVE OR RE-INSTALL AS NECESSARY FOR INSTALLATION OF NEW SERVICES ETC. REFER TO MECHANICAL, ELECTRICAL AND STRUCTURAL DRAWINGS.
- C-1 - EXISTING 2'X4' ACOUSTICAL CEILING TILE
    - T"-BAR
    - SUSPENSION SYSTEM
  - C-2 - EXISTING 2'X2' ACOUSTICAL CEILING TILE
    - T"-BAR
    - SUSPENSION SYSTEM
  - C-3 - EXISTING GYPSUM BOARD ON EXISTING STRUCTURE (FIRE RATED ASSEMBLY)
  - C-4 - EXISTING PLASTER ON WOOD LATH CEILING ON EXISTING STRUCTURE (FIRE RATED ASSEMBLY)
  - C-5 - EXISTING EXPOSED CONCRETE PAINTED
  - C-6 - SALVAGED 2'X4' ACOUSTICAL CEILING TILE
    - T"-BAR
    - SUSPENSION SYSTEM
  - C-7 - STUCCO ON FIBRE CEMENT PANELS C/W REVEALS
  - C-8 - 2 LAYERS OF 5/8" GYPSUM BOARD TYPE X
    - 7/8" FURRING CHANNEL @16 O.C.
    - 2 1/2" METAL CARRYING CHANNEL @16 O.C. SUSPENDED FROM STRUCTURE
    - 1 HOUR F.R.R.
  - C-9 - EXPOSED STEEL DECK
  - C-10 - EXPOSED CONCRETE

- CEILING LEGEND**
- C-1 CEILING TYPE
- F-8 U/S OF CEILING ELEVATION
- ACOUSTIC CEILING TILE & SUSPENSION SYSTEM
  - NEW GYPSUM BOARD CEILING (REFER TO SPECIFICATIONS FOR BOARD TYPE AND FINISH FOR EACH APPLICATION)
  - EXISTING LIGHT FIXTURE
  - 2'-0"x4'-0" RECESSED FLUORESCENT LIGHT FIXTURE
  - 1'-0"x4'-0" RECESSED FLUORESCENT LIGHT FIXTURE
  - 2'-0"x4'-0" SURFACE MOUNTED FLUORESCENT LIGHT FIXTURE
  - SUSPENDED FLUORESCENT LIGHT FIXTURE
  - SURFACE MOUNTED FLUORESCENT LIGHT FIXTURE
  - WALL MOUNTED FLUORESCENT LIGHT FIXTURE
  - ACCESS HATCH
  - CEILING FAN
  - RECTANGULAR SUPPLY AIR DIFFUSER (REFER TO MECHANICAL DWGS FOR SIZE)
  - RETURN AIR GRILLE
  - PATCH WORK TO BE DONE FOR INSTALLATION OF SANITARY DRAIN

- CONSTRUCTION NOTES**
1. PATCH AND REPAIR AREA ADJACENT TO NEW CONSTRUCTION AS REQUIRED.
  2. NO WORK BEING DONE IN THIS AREA, EXCEPT AS BEING NOTED.
  3. EXISTING ARCH TO REMAIN.
  4. PATCH AND REPAIR EXISTING GYPSUM BOARD/PLASTER CEILING TO RECEIVE PAINT FINISH. PROVIDE GYPSUM FOR LARGER AREAS. MAKE FLUSH WITH EXISTING.
  5. FREEZER PANELS BY FREEZER INSTALLER.
  6. VERTICAL GYPSUM BOARD BULKHEAD ON METAL FRAMING SYSTEM AT 7'-6" A.F.F.
  7. EXISTING ACOUSTICAL CEILING TILES AND GRID SYSTEMS TO MODIFIED TO SUIT NEW WALL ASSEMBLY AND MECHANICAL WORK.
  8. PROVIDE 2 LAYERS OF 5/8" GYPSUMBOARD TO U/S OF STRUCTURE. 1 HOUR F.R.R.



- Basement  
 ① Floor Plan  
 ② Ground Floor Plan  
 ③ Second Floor Plan  
 ④ Third Floor Plan  
 ⑤ Roof Plan

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date	revisions

customer  
**YWCA**  
 84 FREDERICK STREET  
 KITCHENER, ONTARIO

project  
**YWCA RENEWAL**  
 84 FREDERICK STREET  
 KITCHENER, ONTARIO

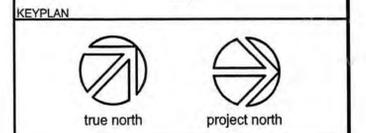
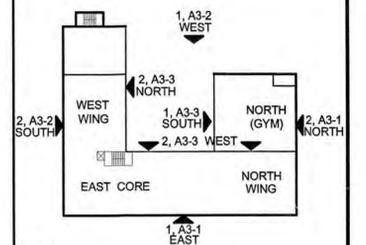
title  
**BASEMENT REFLECTED CEILING PLAN**

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 CAD file: A2-6\_2004043310  
 drawn by: SR  
 checked by:   
 BCIN:   
 sheet no.:   
**A2-6**



*129- please add some lights if not there - 101a & 101b Fridge freezer - are their lights inside?*

**GENERAL NOTES**

1. FILL ALL HOLES THROUGH EXISTING FIRE RATED WALL OR FLOOR ASSEMBLIES AFTER REMOVAL OF EXISTING ELECTRICAL AND MECHANICAL SERVICES. FILL OPENINGS WITH CONCRETE AND OR FIRE STOPPING AS REQUIRED BY CODE.
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-T-BAR  
-SUSPENSION SYSTEM
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-SUSPENSION SYSTEM
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  - C4 - EXISTING PLASTER ON WOOD LATH CEILING ON EXISTING STRUCTURE (FIRE RATED ASSEMBLY)
  - C5 - EXISTING EXPOSED CONCRETE PAINTED
  - C6 - SALVAGED 2'x4' ACOUSTICAL CEILING TILE  
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  - C8 - 2 LAYERS OF 5/8" GYPSUM BOARD TYPE X  
-7/8" FURRING CHANNEL @16 O.C.  
-2 1/2" METAL CARRYING CHANNEL @16 O.C. SUSPENDED FROM STRUCTURE  
-1 HOUR F.R.R.
  - C9 - EXPOSED STEEL DECK
  - C10 - EXPOSED CONCRETE

**CEILING LEGEND**

- C1 CEILING TYPE
- U/S OF CEILING ELEVATION
- ACOUSTIC CEILING TILE & SUSPENSION SYSTEM
- NEW GYPSUM BOARD CEILING (REFER TO SPECIFICATIONS FOR BOARD TYPE AND FINISH FOR EACH APPLICATION)
- EXISTING LIGHT FIXTURE
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- 2'-0"x4'-0" SURFACE MOUNTED FLUORESCENT LIGHT FIXTURE
- SUSPENDED FLUORESCENT LIGHT FIXTURE
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8. PROVIDE 2 LAYERS OF 5/8" GYPSUMBOARD TO U/S OF STRUCTURE. 1 HOUR F.R.R.

**ROOM SCHEDULE**

- 101a FREEZER
- 101b FRIDGE
- 101c DRY STORAGE
- 101d CORRIDOR
- 101e GARBAGE
- 101f RECYCLING
- 101g JANITOR
- 101h ELECTRICAL
- 102a TRANSITIONAL UNIT
- 102b TRANSITIONAL UNIT 4(BEDROOM)
- 102c TRANSITIONAL UNIT 4(BATHROOM)
- 103 STAFF LOCKER ROOM
- 103a STAFF WR ROOM
- 104 KITCHEN PREP
- 108a KITCHEN OFFICE
- 108b DISHWASHING
- 108c FURNACE ROOM
- 109 KITCHEN
- 111 SERVERY
- 112 DINING ROOM
- 120 CORRIDOR
- 122 LOUNGE/COMPUTERS/LIBRARY
- 123a WASHROOM
- 123b TELEPHONE
- 123c FURNACE ROOM
- 124 CORRIDOR
- 125a INTERVIEW ROOM
- 125b RCW ROOM
- 126 VESTIBULE
- 129 COVERED WALK-THRU
- 132 VISITOR'S LOUNGE
- 133a BARRIER FREE UNIT 6(LIVING)
- 133b BARRIER FREE UNIT 6(BEDROOM)
- 133c BARRIER FREE UNIT 6(BATHROOM)
- 134a RECREATION ROOM
- 134b JANITOR
- 135a DOUBLE HEIGHT GYM
- 135b WASHROOM
- 901 EXIT STAIR
- 902 EXIT STAIR
- 903 EXIT STAIR
- 904 EXIT STAIR
- 905 EXIT STAIR

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customer	

**YWCA**  
84 FREDERICK STREET  
KITCHENER, ONTARIO

**YWCA RENEWAL**  
84 FREDERICK STREET  
KITCHENER, ONTARIO

**GROUND FLOOR**  
REFLECTED CEILING PLAN

**THE walterfedy PARTNERSHIP**  
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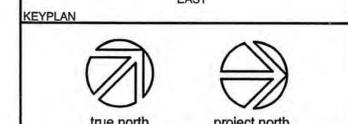
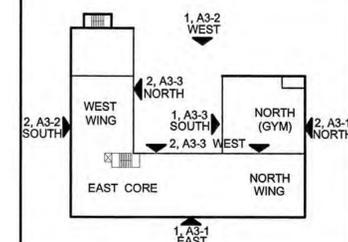
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job no.: 2004-0433-10	
CAD file: A2-7_2004043310	
drawn by: SR	
checked by:	

**A2-7**



**GENERAL NOTES**

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**CEILING TYPE LEGEND**

FOR EXTENT OF CEILING WORK CO-ORDINATE WITH DEMOLITION DRAWINGS. REMOVE OR RE-INSTALL AS NECESSARY FOR INSTALLATION OF NEW SERVICES ETC. REFER TO MECHANICAL, ELECTRICAL AND STRUCTURAL DRAWINGS.

- C-1 -EXISTING 2'X4' ACOUSTICAL CEILING TILE  
-T-BAR  
-SUSPENSION SYSTEM
- C-2 -EXISTING 2'X2' ACOUSTICAL CEILING TILE  
-T-BAR  
-SUSPENSION SYSTEM
- C-3 -EXISTING GYPSUM BOARD ON EXISTING STRUCTURE (FIRE RATED ASSEMBLY)
- C-4 -EXISTING PLASTER ON WOOD LATH CEILING ON EXISTING STRUCTURE (FIRE RATED ASSEMBLY)
- C-5 -EXISTING EXPOSED CONCRETE PAINTED
- C-6 -SALVAGED 2'X4' ACOUSTICAL CEILING TILE  
-T-BAR  
-SUSPENSION SYSTEM
- C-7 -STUCCO ON FIBRE CEMENT PANELS C/W REVEALS
- C-8 -2 LAYERS OF 5/8" GYPSUM BOARD TYPE X  
-7/8" FURRING CHANNEL @16 O.C.  
-2 1/2" METAL CARRYING CHANNEL @16 O.C. SUSPENDED FROM STRUCTURE  
-1 HOUR F.R.R.
- C-9 -EXPOSED STEEL DECK
- C-10 -EXPOSED CONCRETE

**CEILING LEGEND**

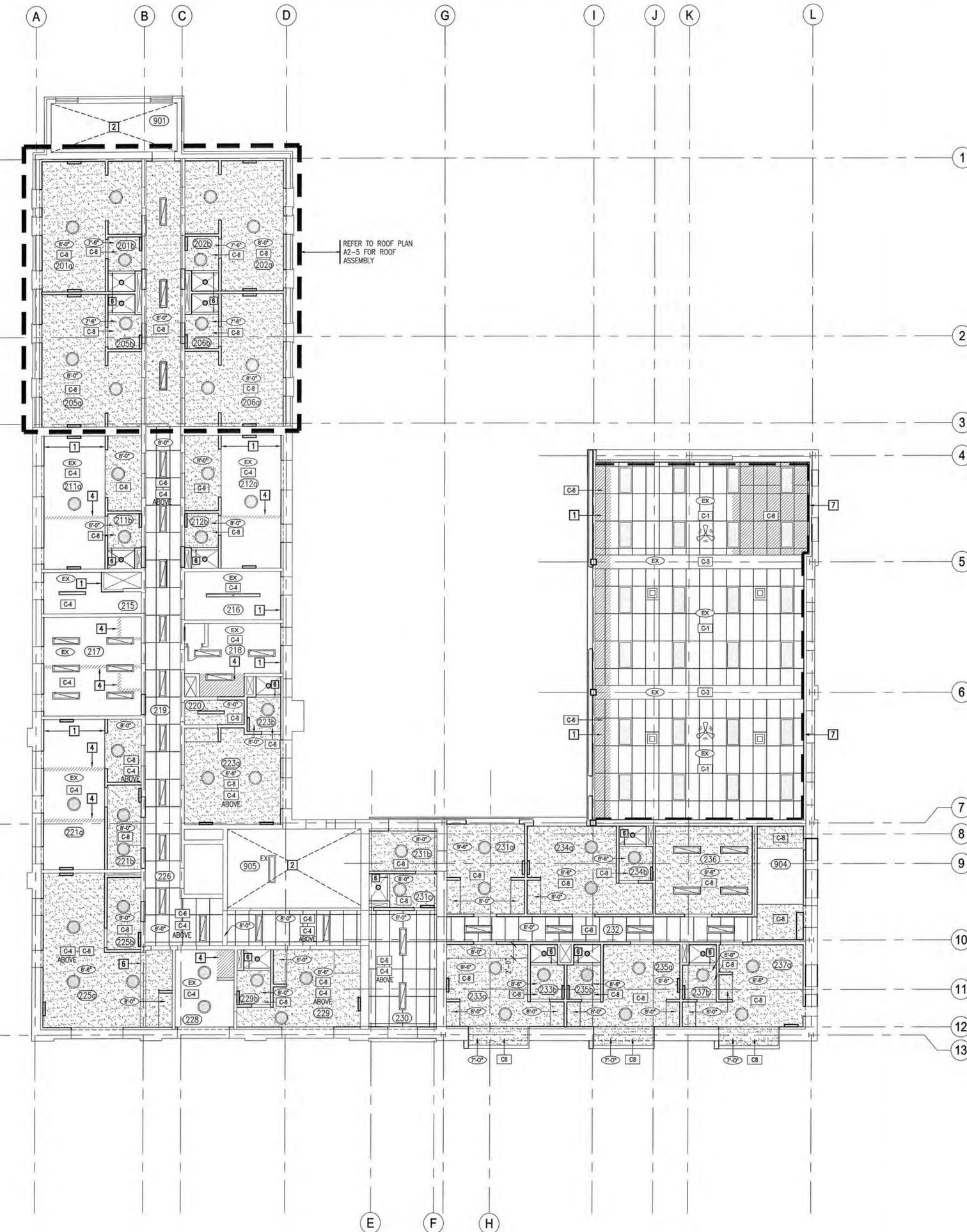
- C-1 CEILING TYPE
- 7-9" U/S OF CEILING ELEVATION
- ACOUSTIC CEILING TILE & SUSPENSION SYSTEM
- NEW GYPSUM BOARD CEILING (REFER TO SPECIFICATIONS FOR BOARD TYPE AND FINISH FOR EACH APPLICATION)
- EX EXISTING LIGHT FIXTURE
- 2'-0"x4'-0" RECESSED FLOURESCENT LIGHT FIXTURE
- 1'-0"x4'-0" RECESSED FLOURESCENT LIGHT FIXTURE
- 2'-0"x4'-0" SURFACE MOUNTED FLOURESCENT LIGHT FIXTURE
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- ACCESS HATCH
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**CONSTRUCTION NOTES**

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7. EXISTING ACOUSTICAL CEILING TILES AND GRID SYSTEMS TO MODIFIED TO SUIT NEW WALL ASSEMBLY AND MECHANICAL WORK.
8. PROVIDE 2 LAYERS OF 5/8" GYPSUMBOARD TO U/S OF STRUCTURE. 1 HOUR F.R.R.

**ROOM SCHEDULE**

- 201a BEDROOM
- 201b BATHROOM
- 202a BEDROOM
- 202b BATHROOM
- 205a BEDROOM
- 205b BATHROOM
- 206a BEDROOM
- 206b BATHROOM
- 211a BEDROOM
- 211b BATHROOM
- 212a BEDROOM
- 212b BATHROOM
- 215 LINEN STORAGE
- 216 RESERVED
- 217 KITCHEN LOUNGE
- 218 LAUNDRY
- 219 CORRIDOR
- 220 JANITOR
- 221a BEDROOM
- 221b BATHROOM
- 223a BEDROOM
- 223b BATHROOM
- 225a BEDROOM
- 225b BATHROOM
- 226 CORRIDOR
- 228 QUIET ROOM
- 229a BEDROOM
- 229b BATHROOM
- 230 CORRIDOR
- 231a BEDROOM
- 231b BEDROOM
- 231c BATHROOM
- 232 CORRIDOR
- 233a BEDROOM
- 233b BATHROOM
- 234a BEDROOM
- 234b BATHROOM
- 235a BEDROOM
- 235b BATHROOM
- 236 KITCHEN/LOUNGE
- 237a BEDROOM
- 237b BATHROOM
- 901 EXIT STAIR
- 904 EXIT STAIR
- 905 EXIT STAIR



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date	revisions
customer	
project	YWCA RENEWAL 84 FREDERICK STREET KITCHENER, ONTARIO
title	SECOND FLOOR REFLECTED CEILING PLAN

**THE walterfedy PARTNERSHIP ARCHITECTS • ENGINEERS**

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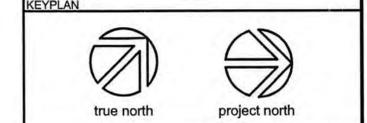
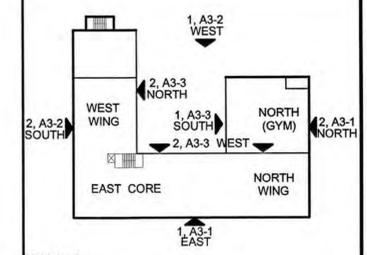
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BCIN:  
sheet no.:

**A2-8**





date	ISSUED FOR BUILDING PERMIT
date	revisions
customer	YWCA 84 FREDERICK STREET KITCHENER, ONTARIO
project	YWCA RENEWAL 84 FREDERICK STREET KITCHENER, ONTARIO
title	THIRD FLOOR REFLECTED CEILING PLAN

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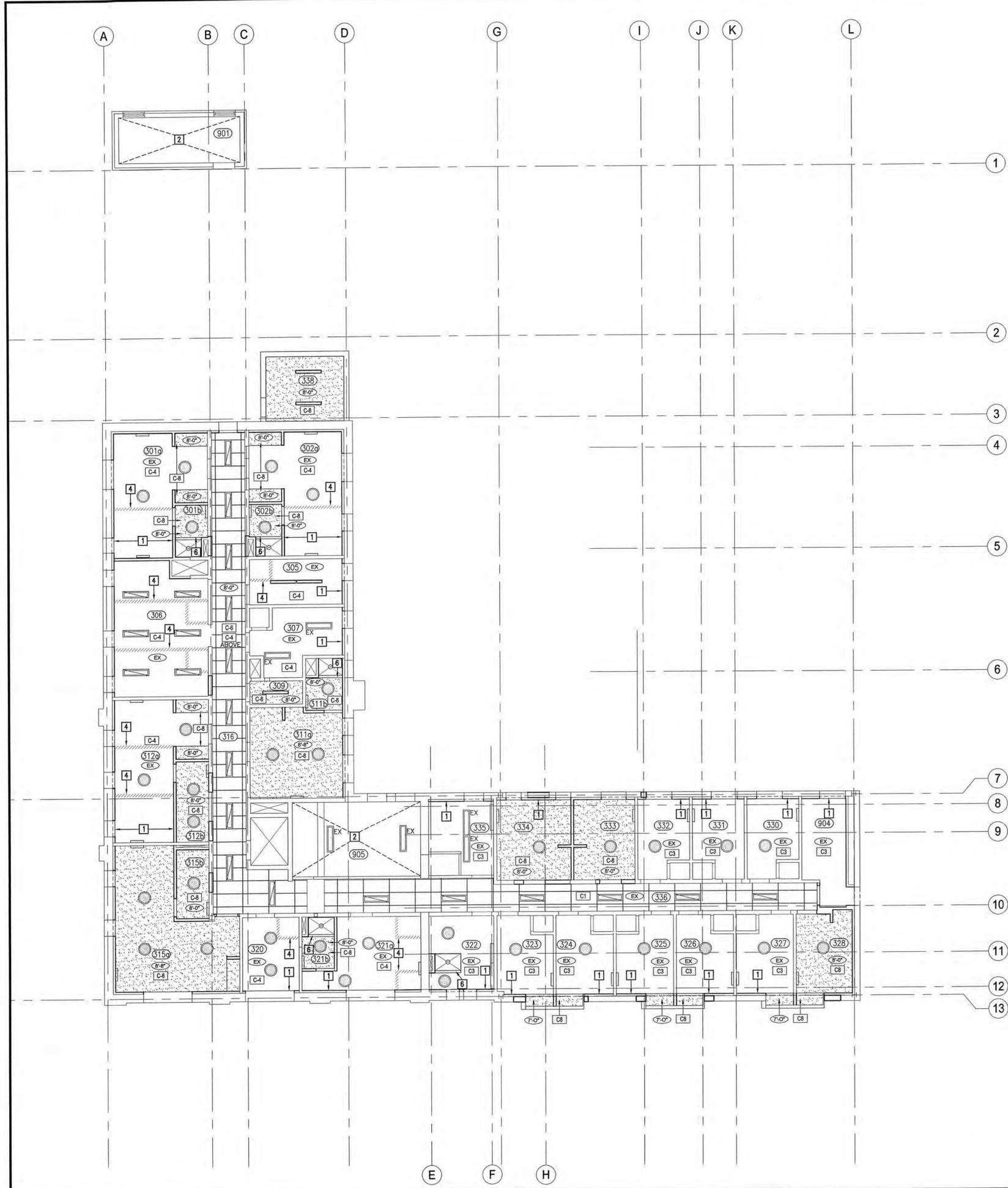
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checked by:

BCIN:  
sheet no.:  
**A2-9**



**GENERAL NOTES**

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**CEILING TYPE LEGEND**

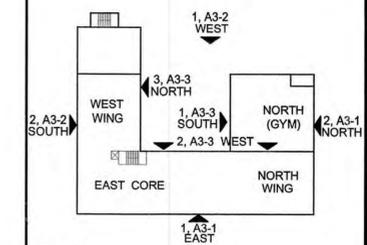
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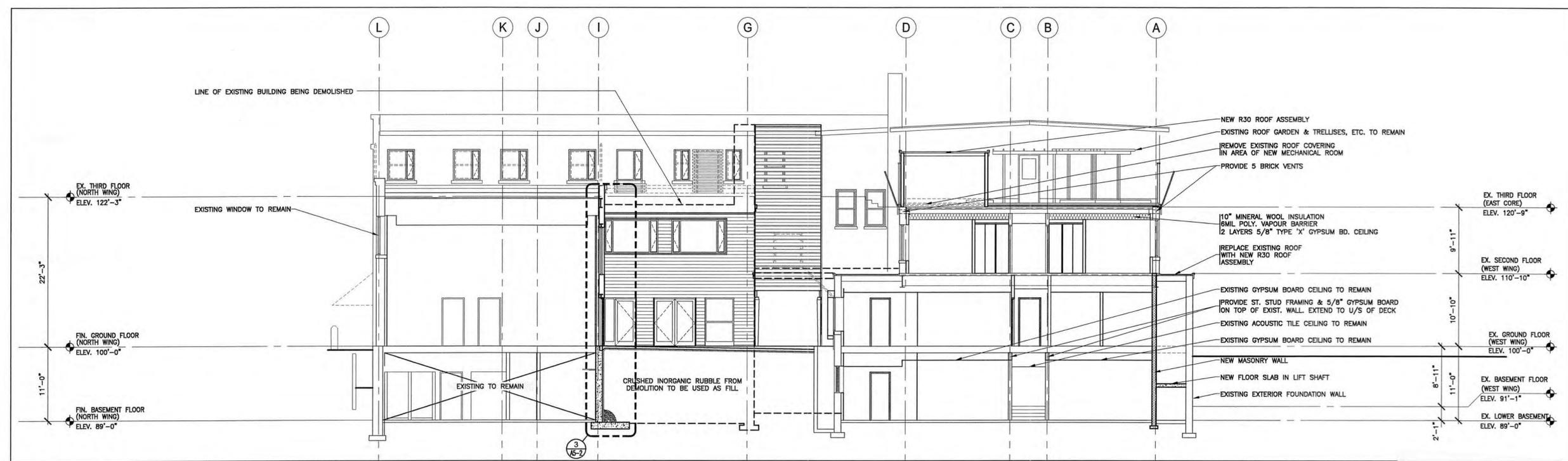
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- PATCH WORK TO BE DONE FOR INSTALLATION OF SANITARY DRAIN

**CONSTRUCTION NOTES**

1. PATCH AND REPAIR AREA ADJACENT TO NEW CONSTRUCTION AS REQUIRED.
2. NO WORK BEING DONE IN THIS AREA, EXCEPT AS BEING NOTED.
3. EXISTING ARCH TO REMAIN.
4. PATCH AND REPAIR EXISTING GYPSUM BOARD/PLASTER CEILING TO RECEIVE PAINT FINISH. PROVIDE GYPSUM FOR LARGER AREAS. MAKE FLUSH WITH EXISTING.
5. FREEZER PANELS BY FREEZER INSTALLER.
6. VERTICAL GYPSUM BOARD BULKHEAD ON METAL FRAMING SYSTEM AT 7'-6" A.F.F.
7. EXISTING ACOUSTICAL CEILING TILES AND GRID SYSTEMS TO MODIFIED TO SUIT NEW WALL ASSEMBLY AND MECHANICAL WORK.
8. PROVIDE 2 LAYERS OF 5/8" GYPSUMBOARD TO U/S OF STRUCTURE. 1 HOUR F.R.R.



KEYPLAN



1 WEST INTERIOR SECTIONAL ELEVATION  
1/8"=1'-0"

Building  
Elevations  
(x3)

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date	revisions
customer	YWCA 84 FREDERICK STREET KITCHENER, ONTARIO
project	YWCA RENEWAL 84 FREDERICK STREET KITCHENER, ONTARIO
title	BUILDING SECTION



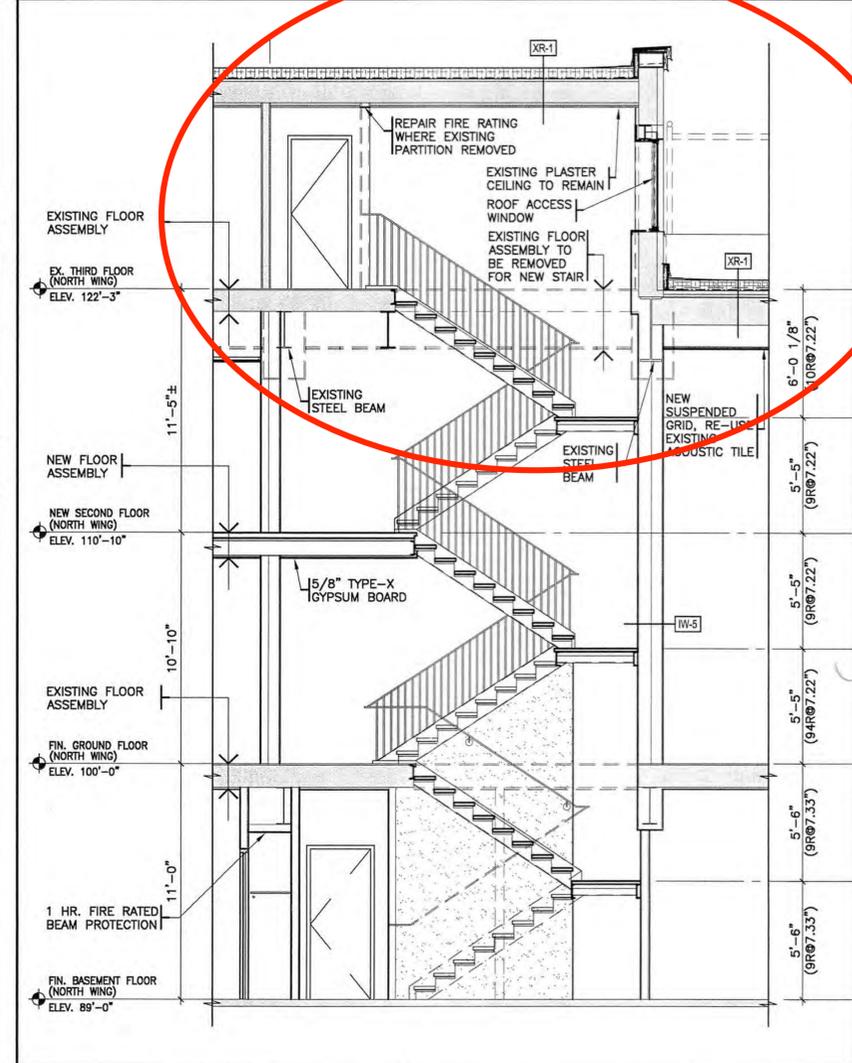
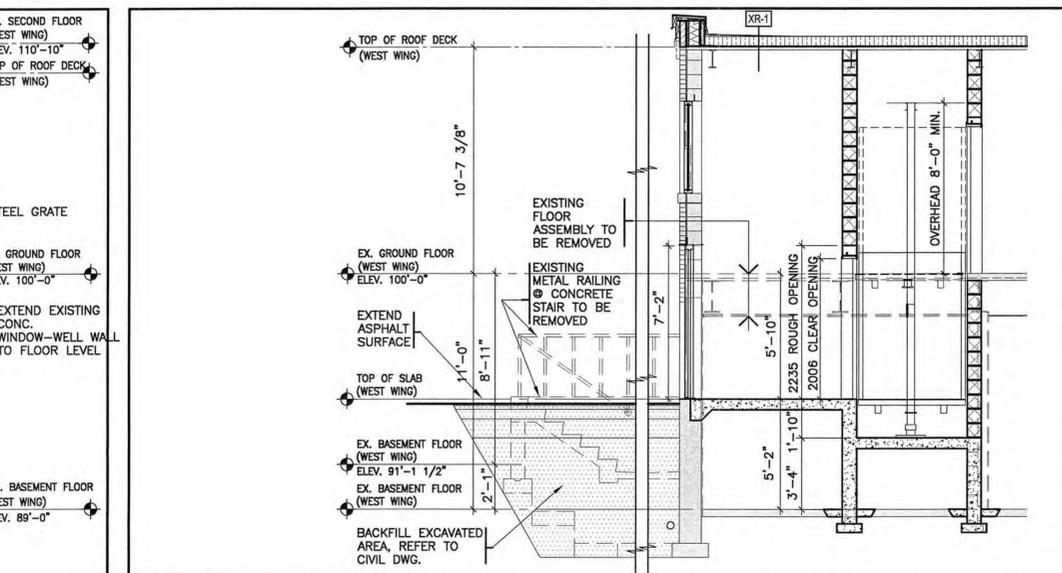
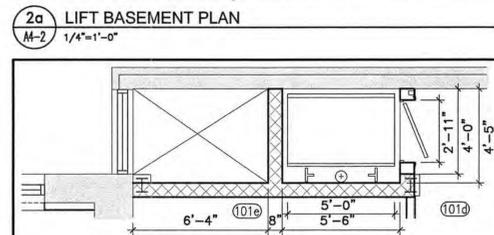
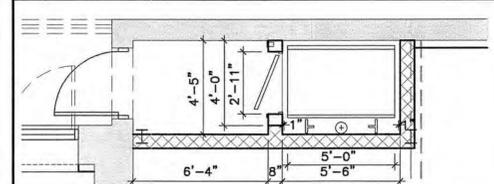
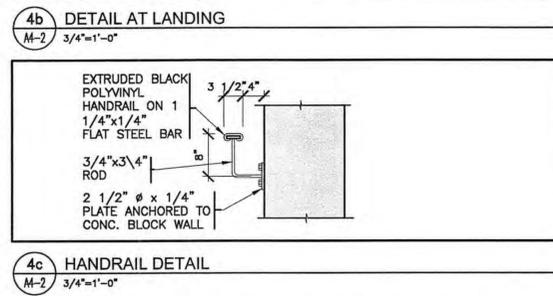
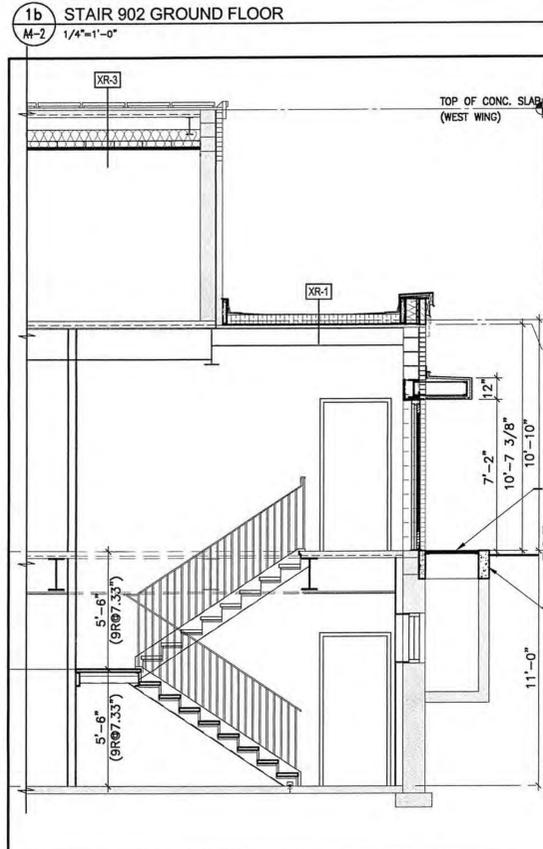
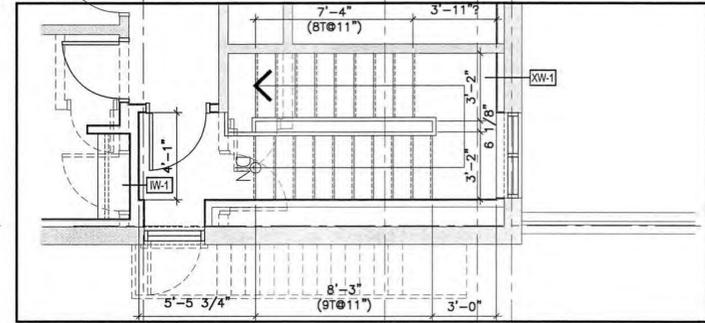
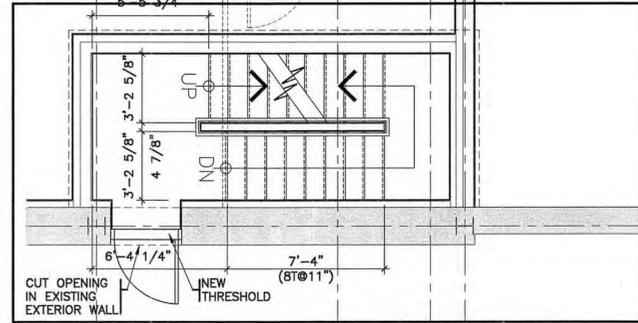
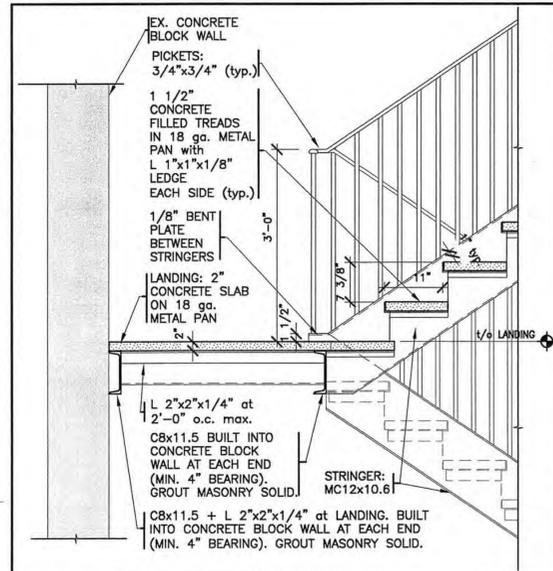
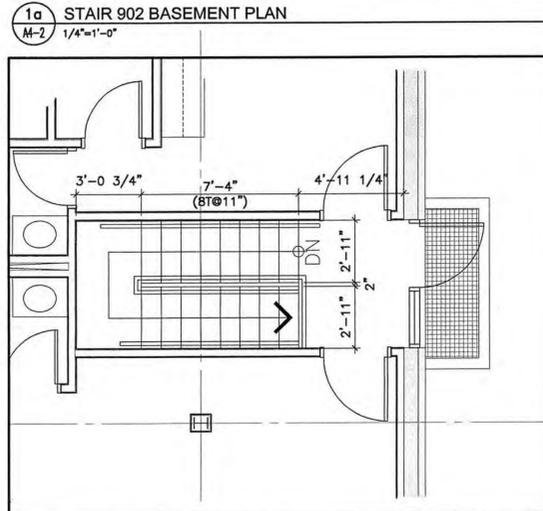
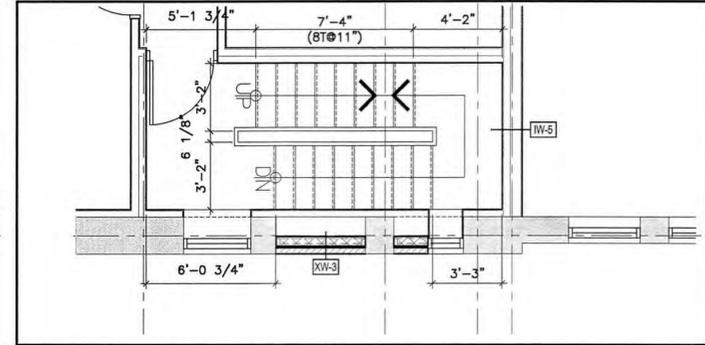
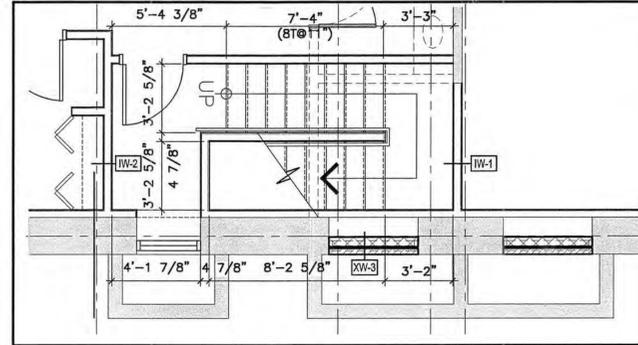
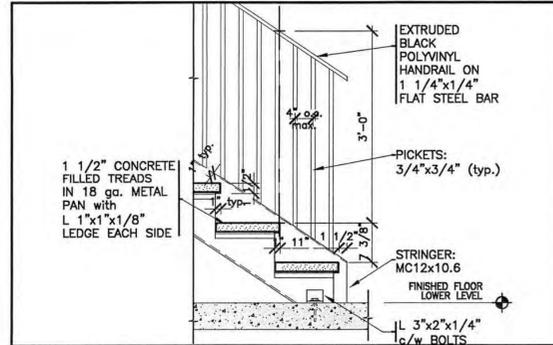
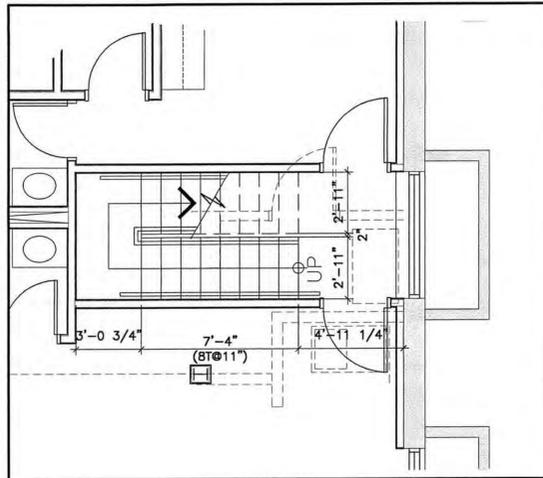
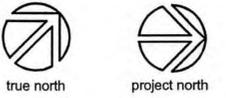
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checked by:

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**A4-1**



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customer  
**YWCA RENEWAL**  
84 FREDERICK STREET  
KITCHENER, ONTARIO

project  
**STAIRS & FREIGHT PLATFORM LIFT**  
PLANS & SECTIONS

title  
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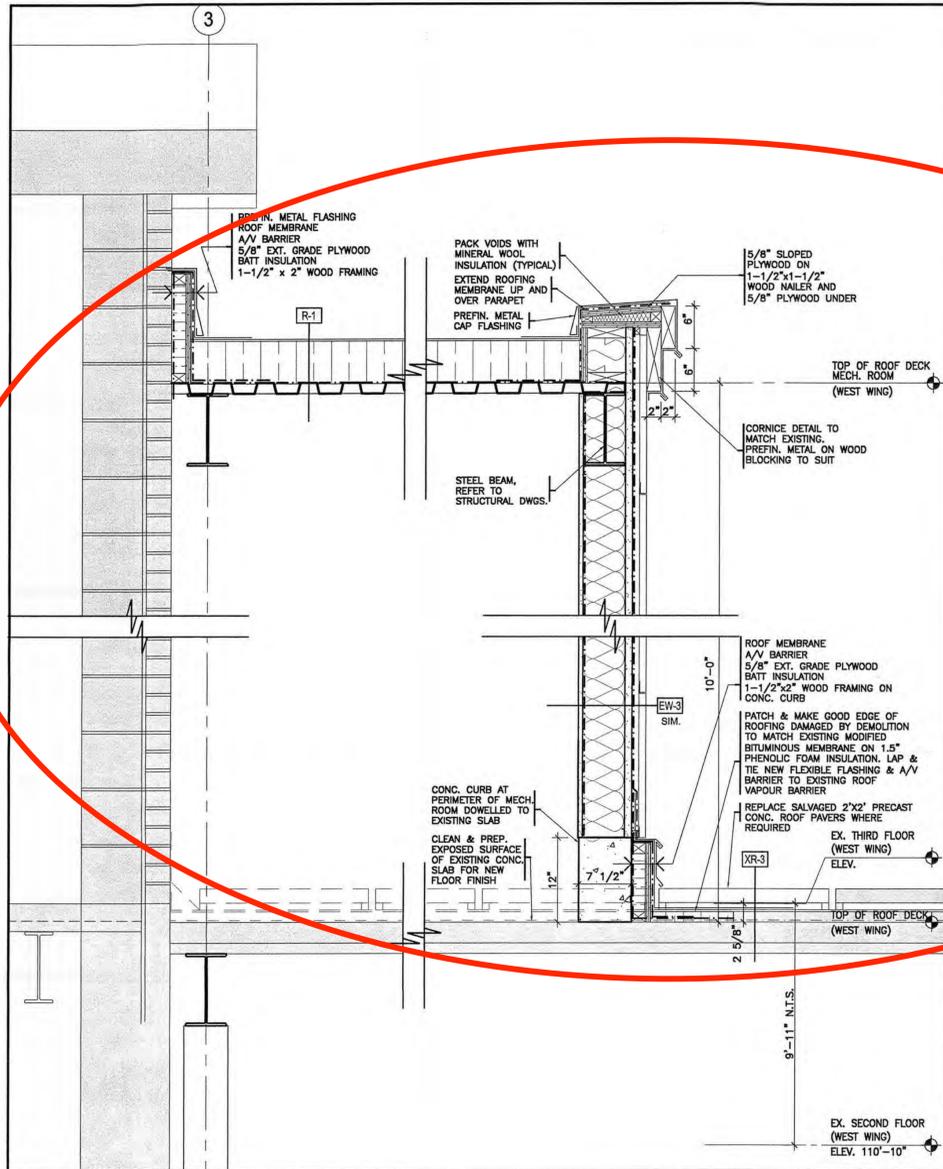
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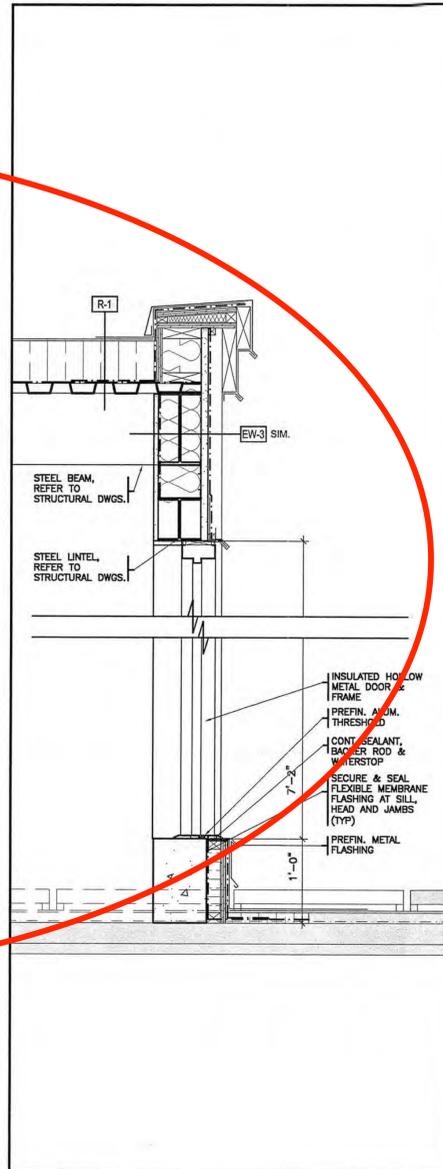
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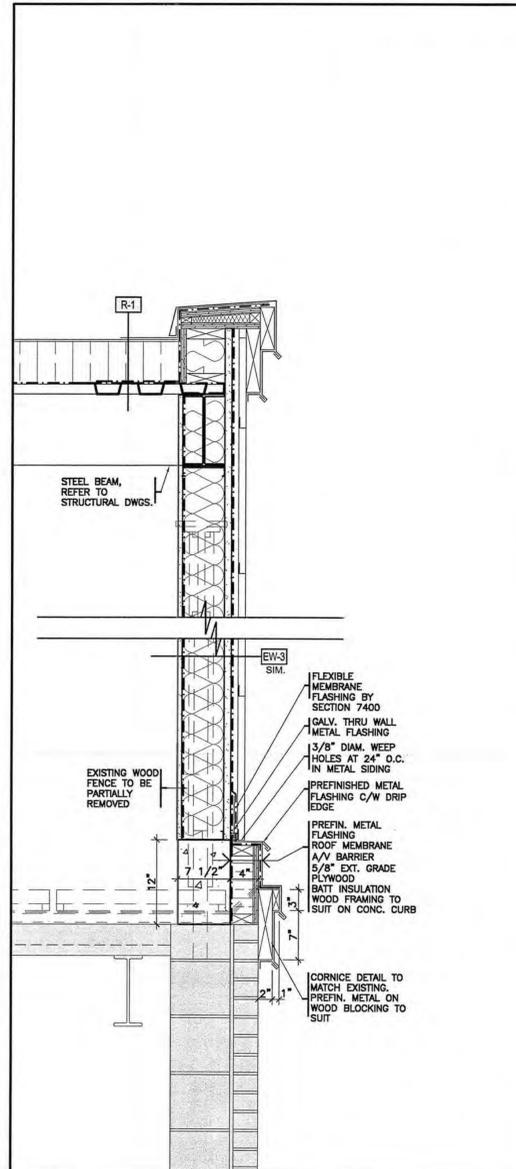
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LICENCE 3161



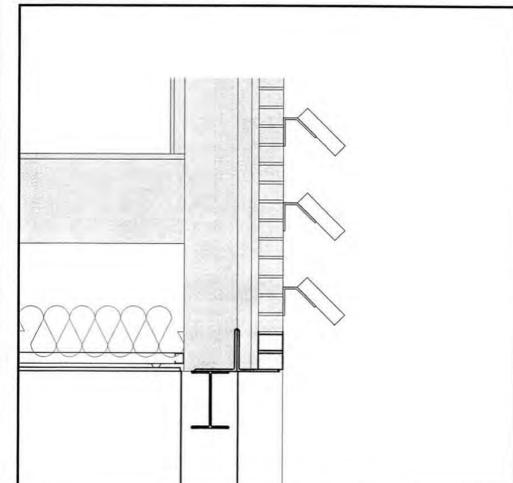
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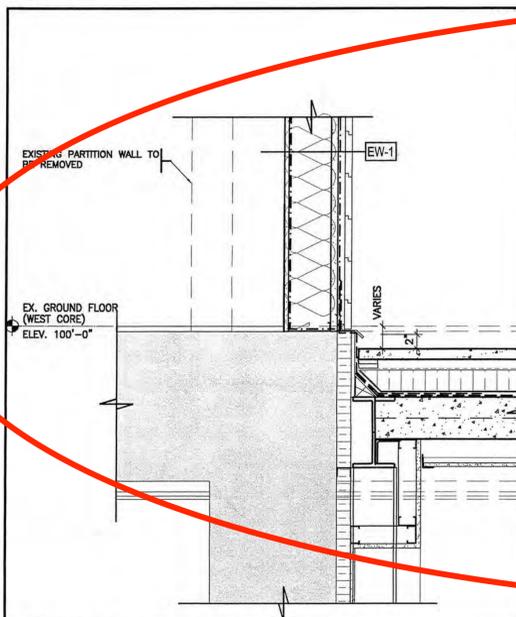
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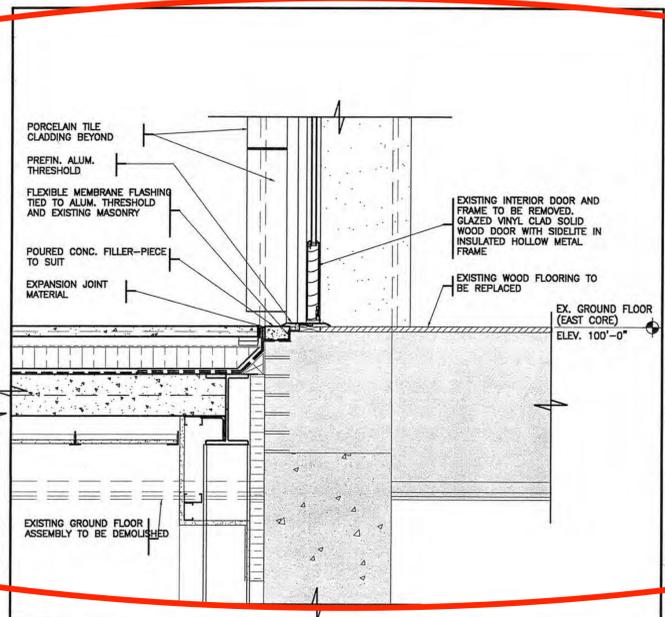
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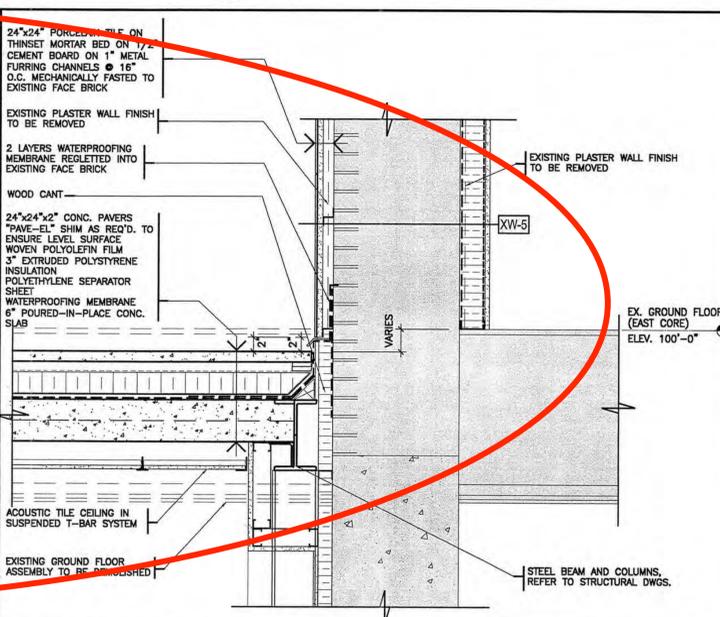
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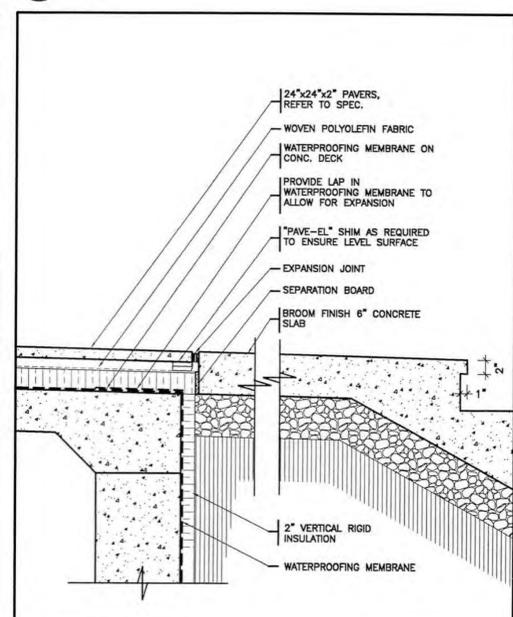
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A5-1 1"=1'-0"



6 DETAIL  
A5-1 1"=1'-0"



7 DETAIL  
A5-1 1"=1'-0"



8 DETAIL  
A5-1 1"=1'-0"

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customer  
**YWCA RENEWAL**  
84 FREDERICK STREET  
KITCHENER, ONTARIO

project  
title  
**SECTION DETAILS**

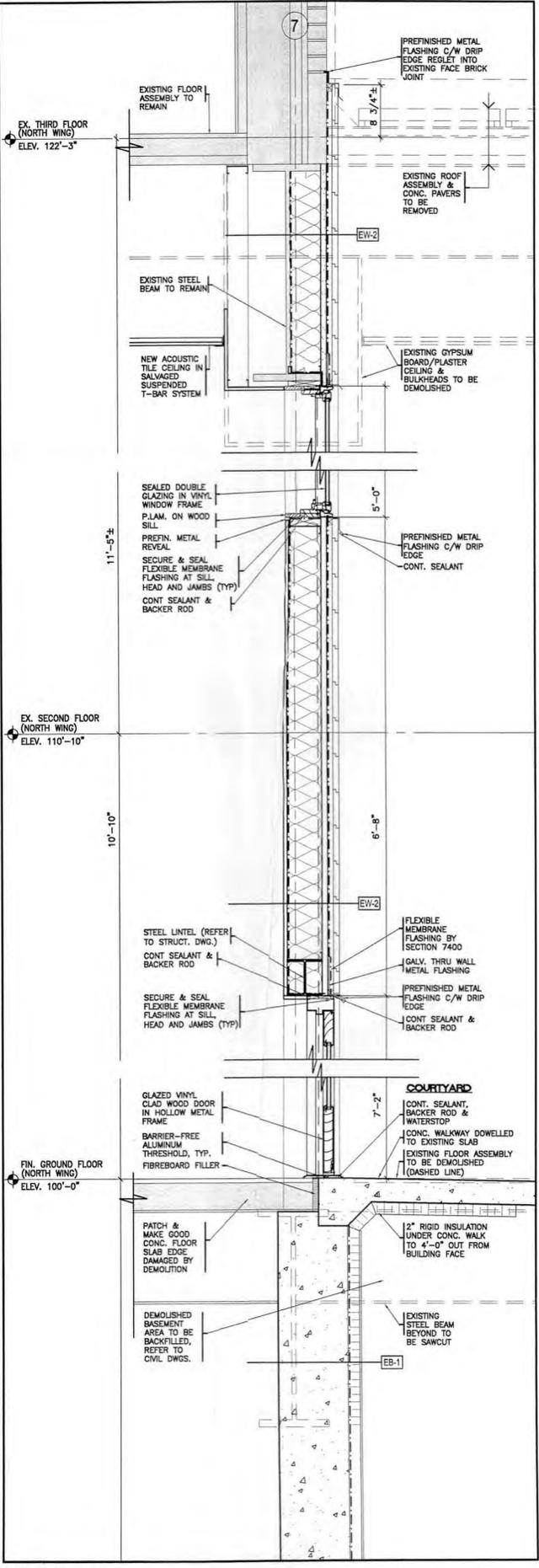
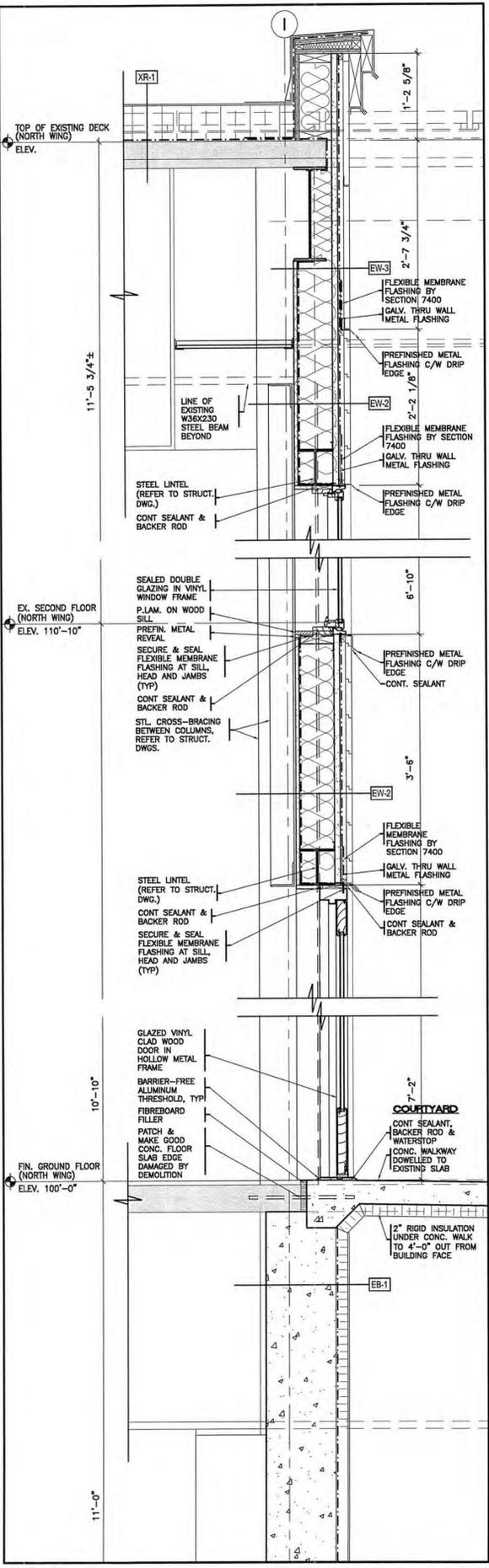
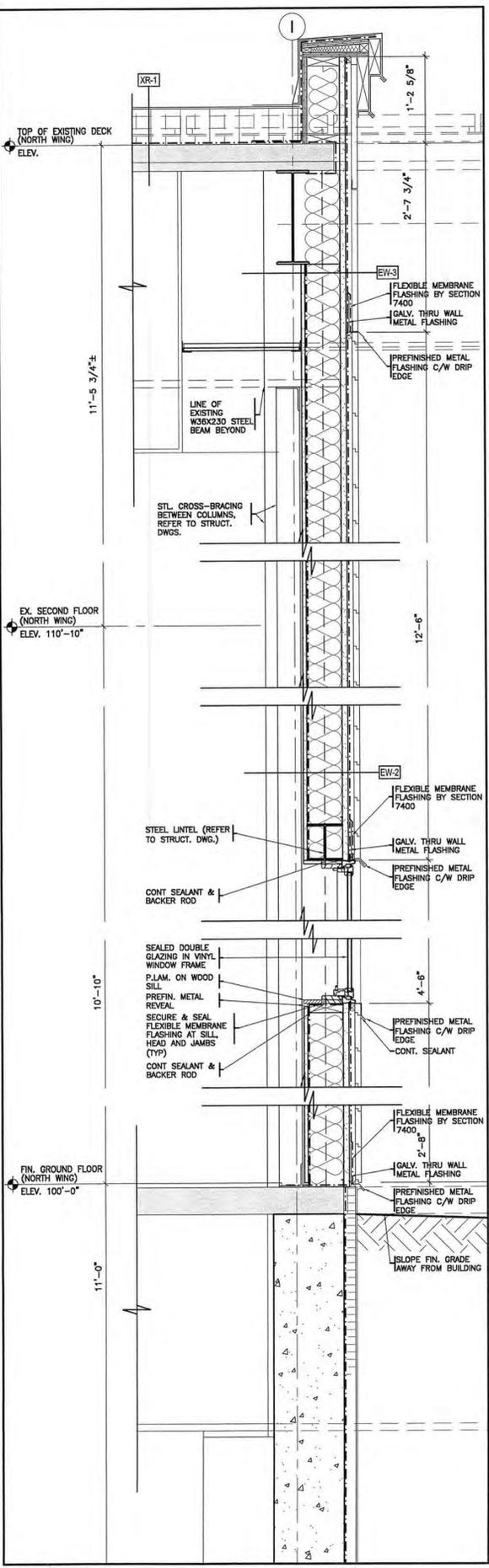
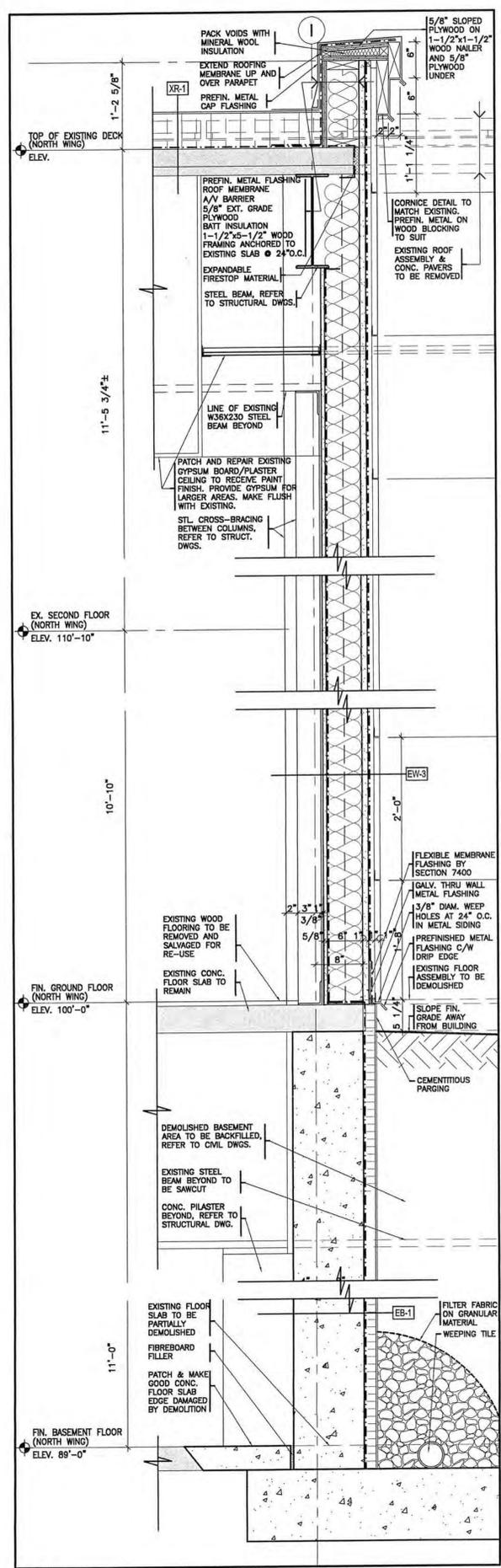
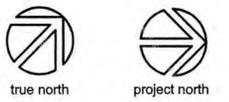
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checked by:

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customer	

**YWCA RENEWAL**  
84 FREDERICK STREET  
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project  
title  
**SECTION DETAILS**

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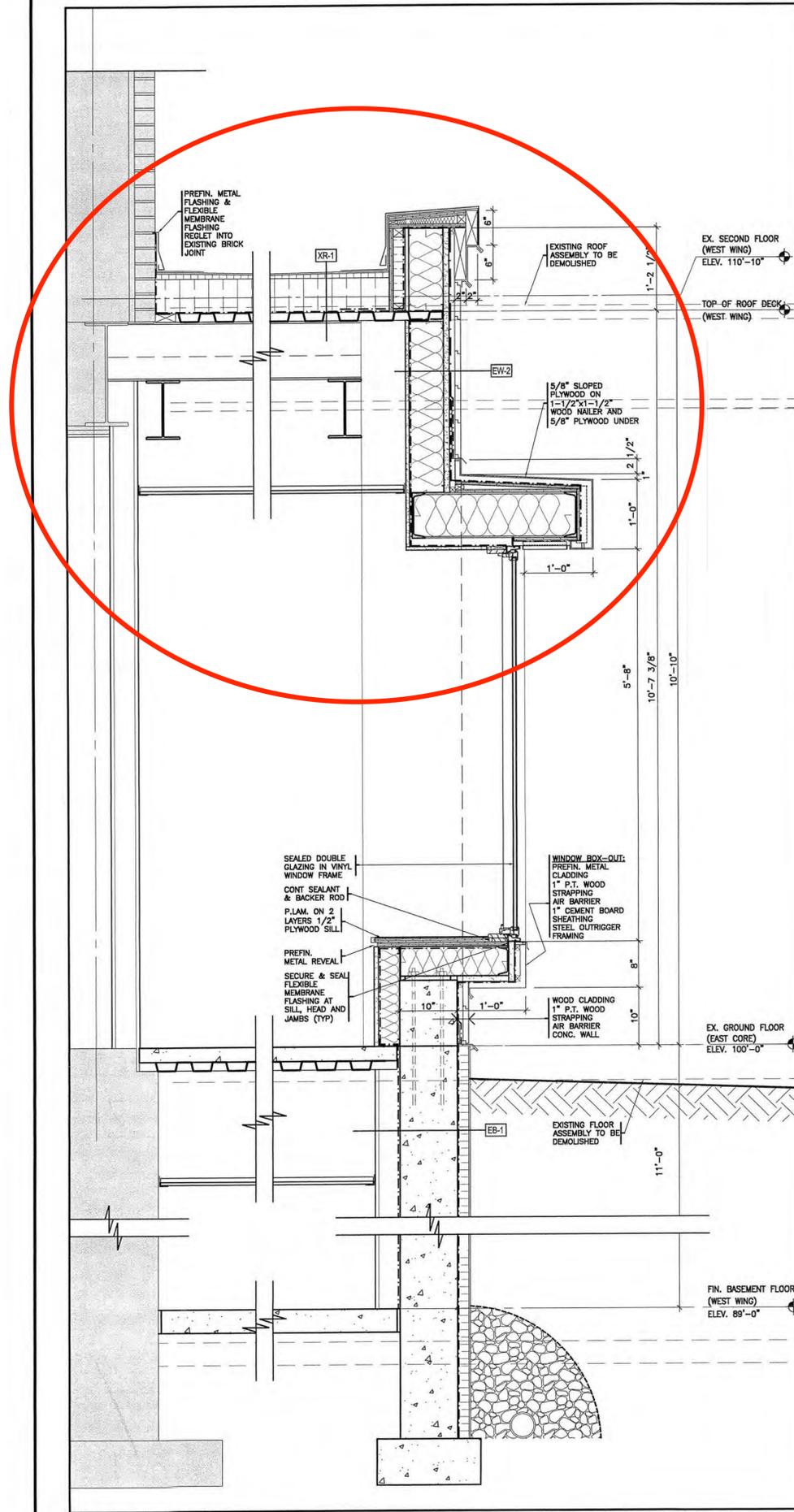
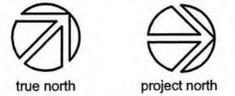
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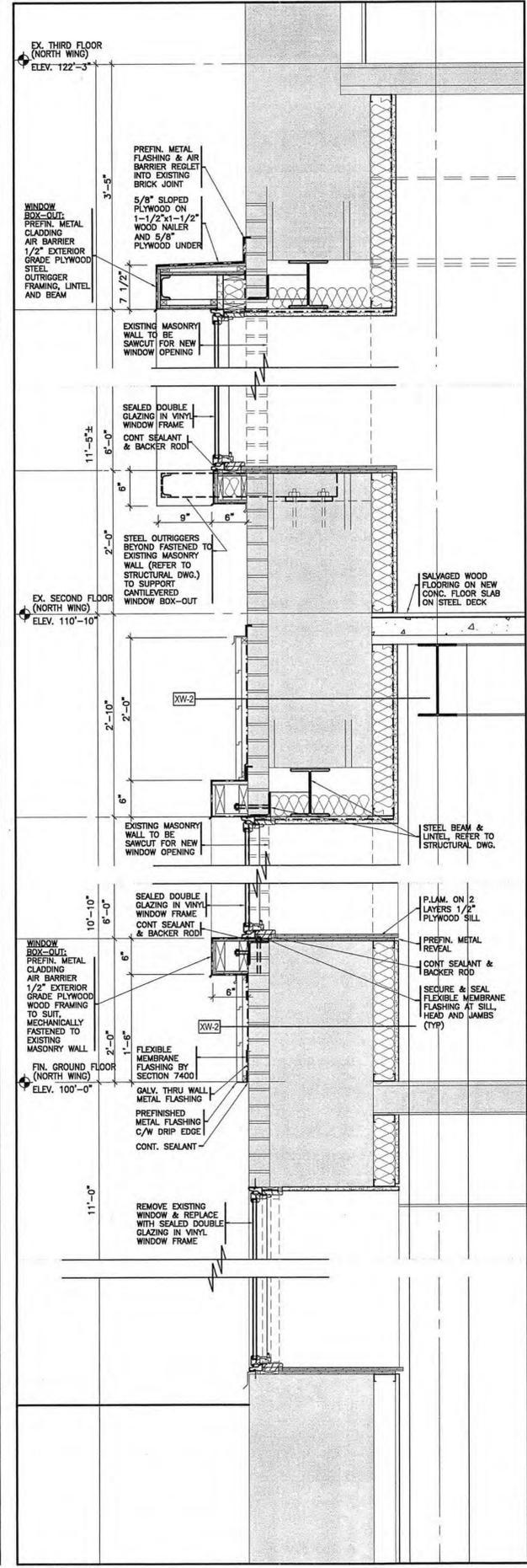


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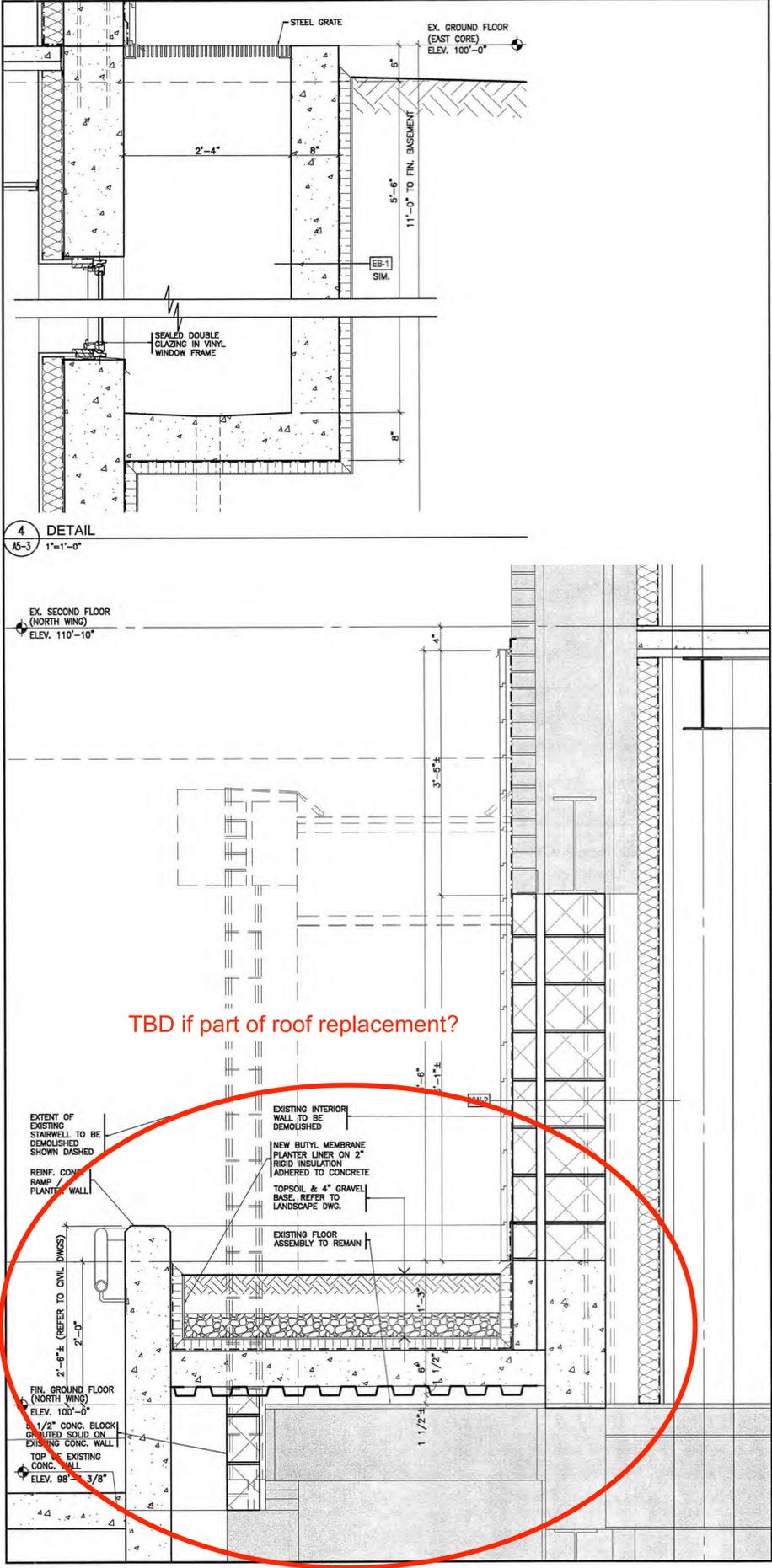
**A5-2**



1 DETAIL  
A5-3 1"=1'-0"



2 DETAIL  
A5-3 1"=1'-0"



3 DETAIL  
A5-3 1"=1'-0"

TBD if part of roof replacement?

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customer  
**YWCA RENEWAL**  
84 FREDERICK STREET  
KITCHENER, ONTARIO

project  
title  
**SECTION DETAILS**

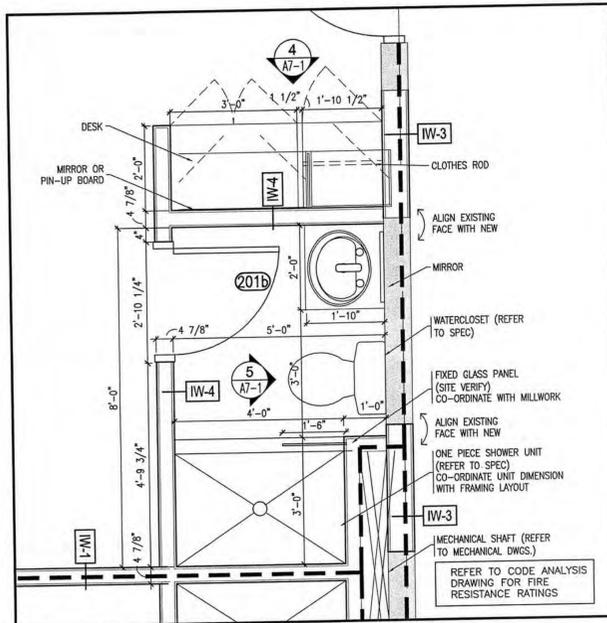
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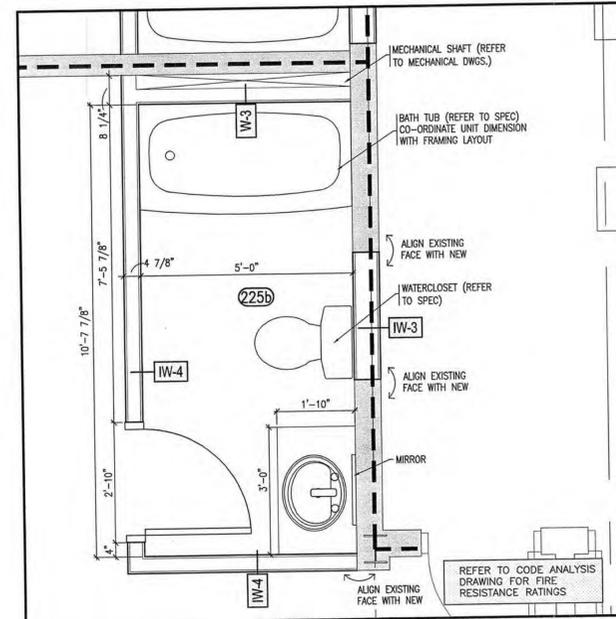


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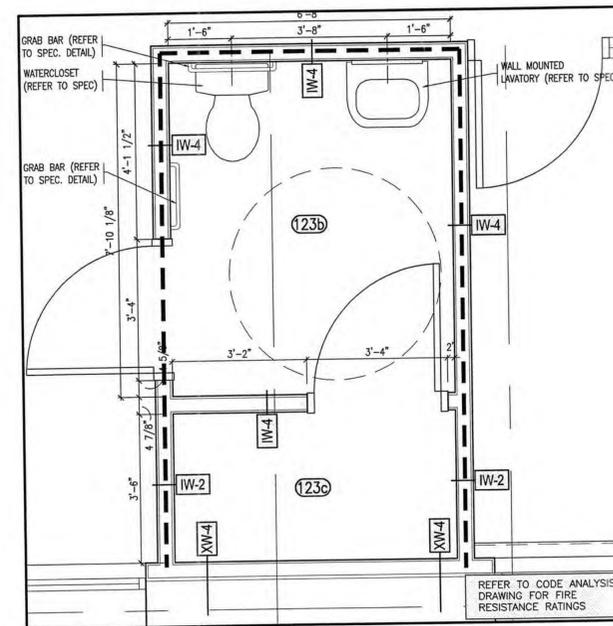
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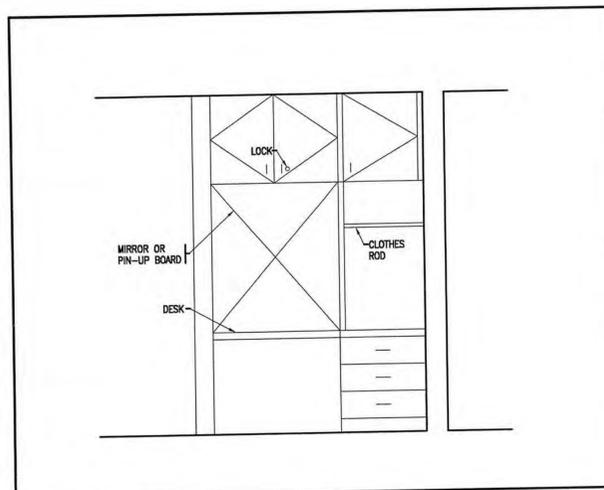
1 ENLARGED PLAN - TYPICAL WASHROOM LAYOUT (PRE-FAB SHOWER)  
A7-1 3/4"=1'-0"



2 ENLARGED PLAN - TYPICAL WASHROOM LAYOUT (BATH TUB)  
A7-1 3/4"=1'-0"

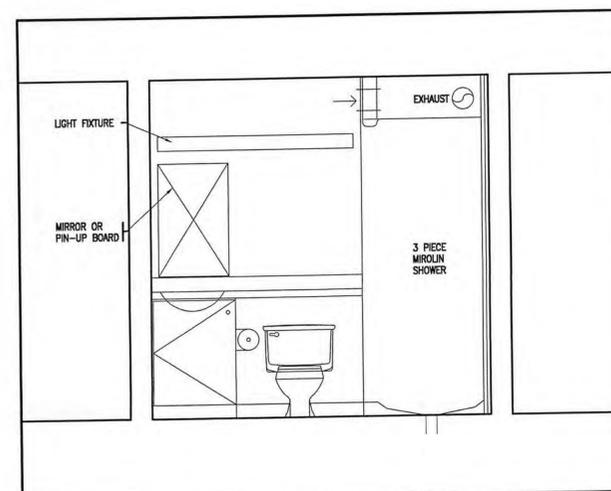


3 ENLARGED PLAN - BARRIER FREE WASHROOM LAYOUT  
A7-1 3/4"=1'-0"



4 INTERIOR ELEVATION - MILLWORK  
A7-1 1/2"=1'-0"

*Thank you!*



5 INTERIOR ELEVATION - TYPICAL WASHROOM  
A7-1 1/2"=1'-0"

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date	revisions

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project

title  
**ENLARGED FLOOR PLAN**

**THE Walterfedy PARTNERSHIP**  
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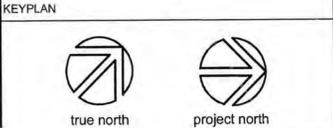
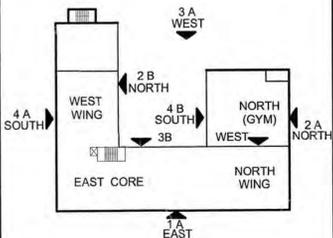
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checked by:

BCIN:  
sheet no.:  
**A7-1**



I HAVE REVIEWED AND TAKEN RESPONSIBILITY FOR THE DESIGN WORK ON BEHALF OF THE WALTER FEDY PARTNERSHIP.

SIGNATURE: *J. Wuohela*  
 NAME: J. WUOHELA  
 BCIN: 22046

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customer: YWCA  
 84 FREDERICK STREET  
 KITCHENER, ONTARIO

project: YWCA RENEWAL  
 84 FREDERICK STREET  
 KITCHENER, ONTARIO

title: GENERAL NOTES AND DETAILS

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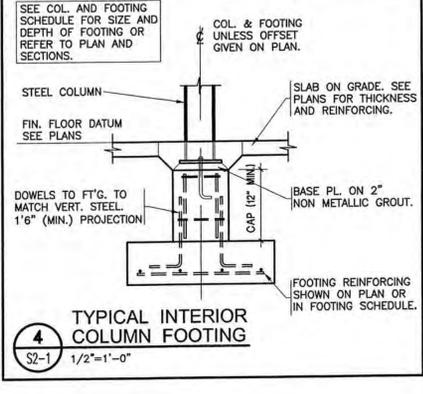
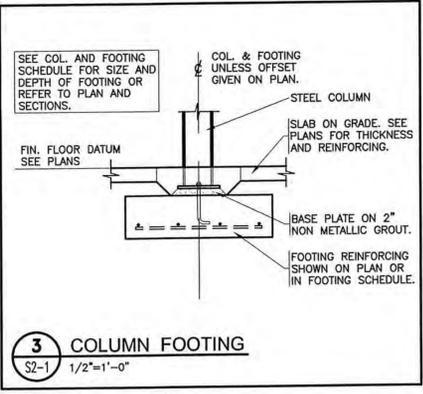
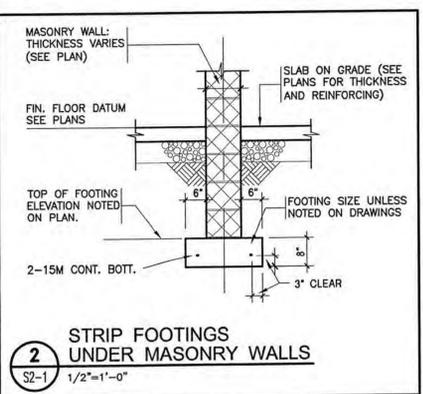
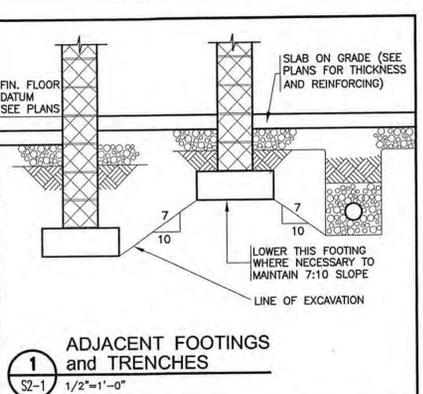
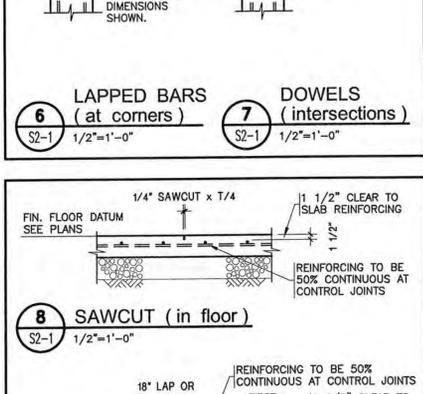
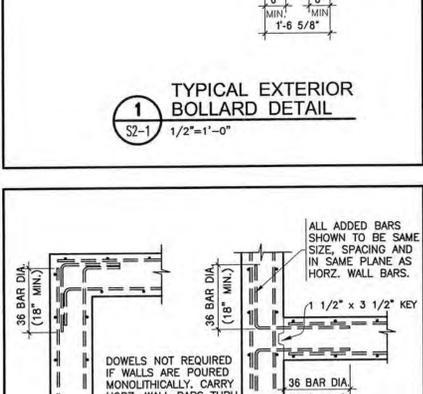
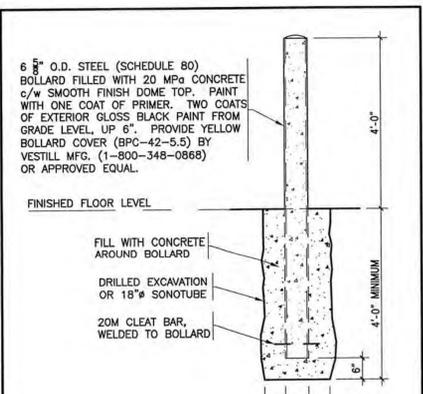
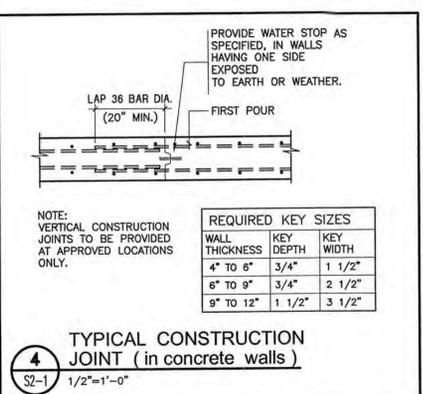
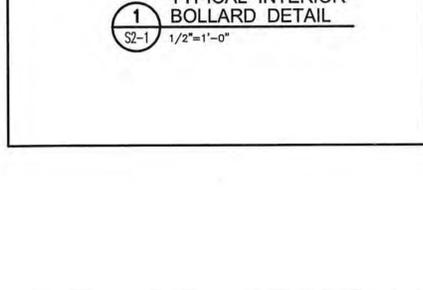
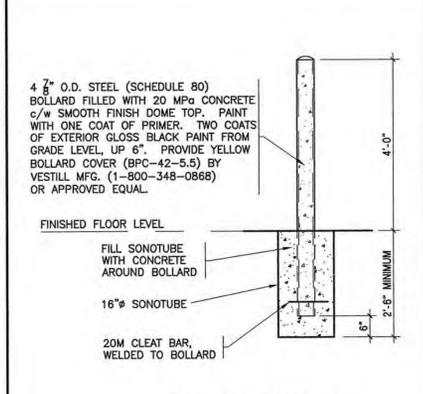
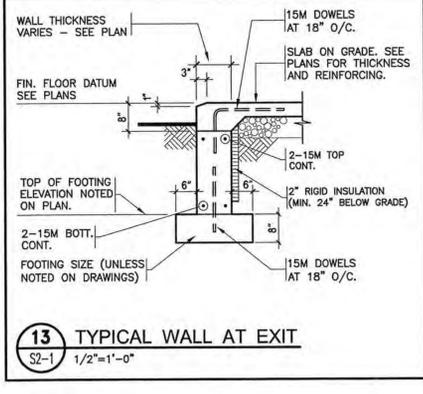
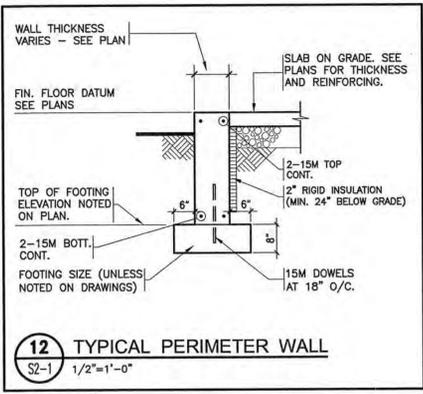
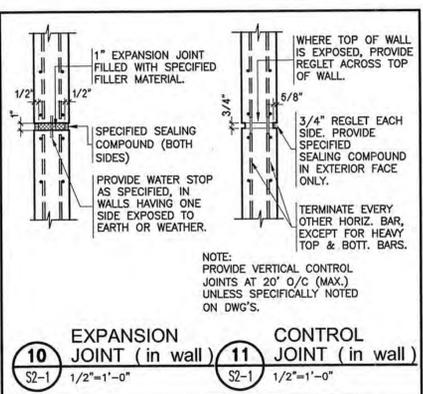
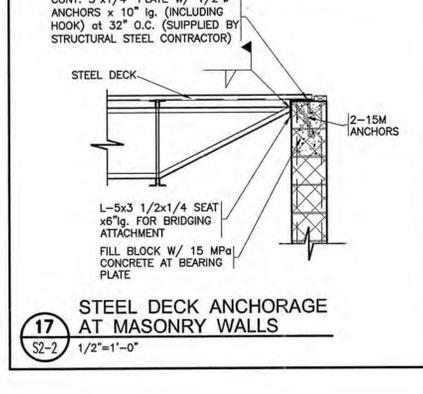
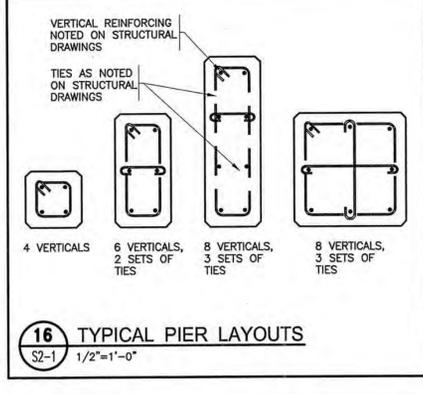
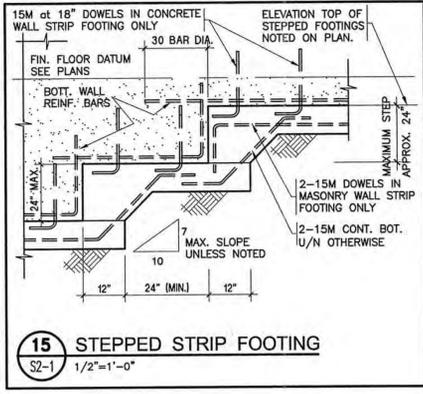
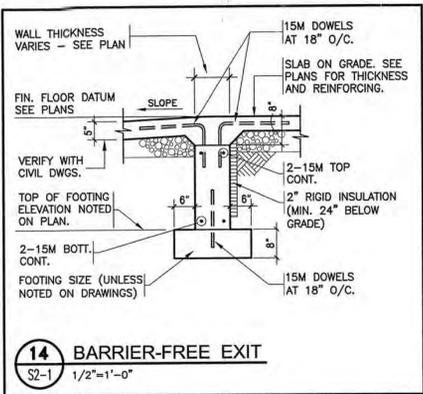
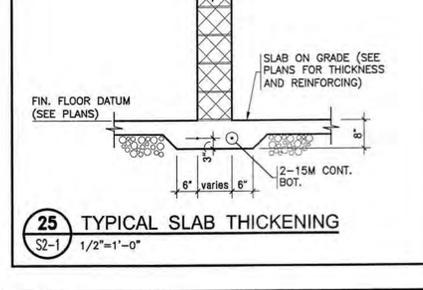
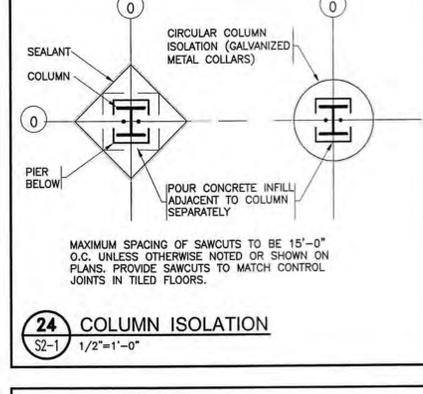
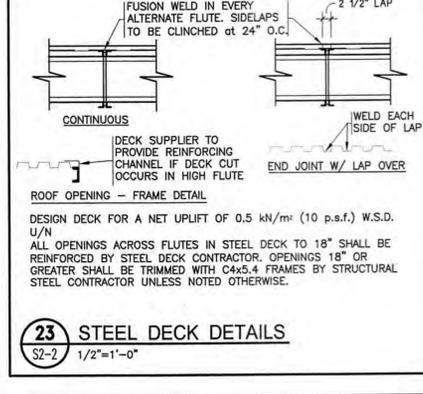
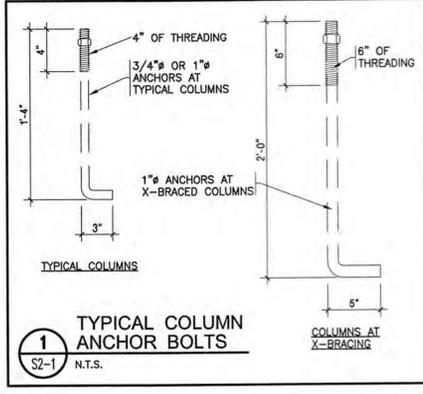
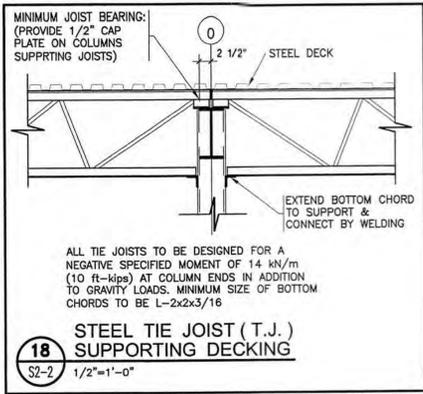
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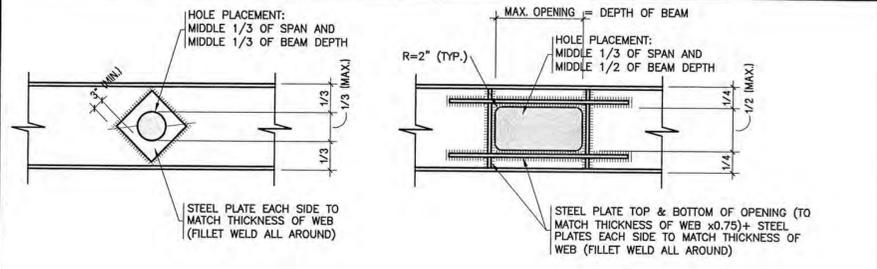
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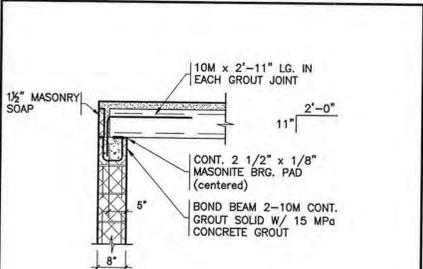
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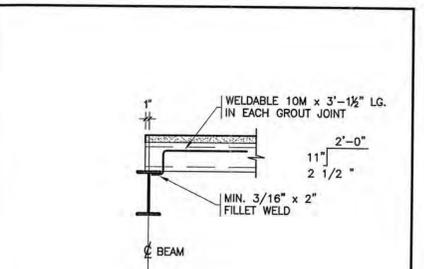


**19 HOLE IN BEAM FOR PIPES**  
S2-2 1/2"=1'-0"

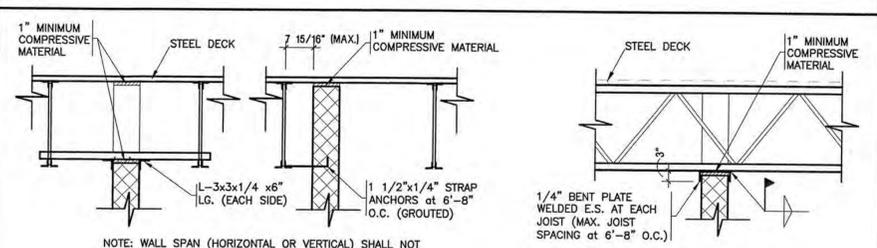
**20 HOLE IN BEAM FOR DUCTWORK**  
S2-2 1/2"=1'-0"



**28 PRECAST END BEARING AT INTERIOR MASONRY WALL**  
S2-3 1/2"=1'-0"

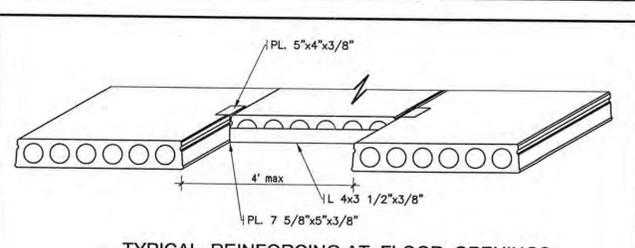


**33 END BEARING AT STEEL BEAMS**  
S2-3 1/2"=1'-0"



**21 PARTITION PARALLEL TO JOISTS**  
S2-2 1/2"=1'-0"

**22 PARTITIONS PERPENDICULAR TO JOISTS**  
S2-2 1/2"=1'-0"



**29 TYPICAL REINFORCING AT FLOOR OPENINGS - BY HOLLOW CORE MANUFACTURER**  
S2-3 1/2"=1'-0"

**BASEPLATE SCHEDULE**

COL TYPE	BASEPLATE DIMENSIONS	ANCHOR BOLTS
HSS 10x10	18x18x5/8"	2-5/8"
HSS 8x8	16x16x5/8"	2-5/8"
HSS 6x6	14x14x5/8"	2-5/8"
HSS 5x5	13x13x5/8"	2-5/8"

**COLUMN SCHEDULE**

MARK	COLUMN SIZE
C1	HSS 8x8x0.25
C2	HSS 6x6x0.25
C3	HSS 5x5x0.25
C4	HSS 10x10x0.375
C5	HSS 6x6x0.375
C6	HSS 8x8x0.375
C7	HSS 6x6x0.50
C8	HSS 4x4x0.25

**BEARING PLATE SCHEDULE**

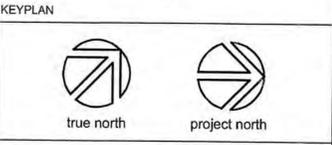
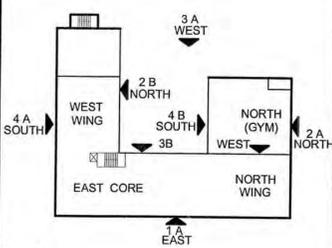
MARK	BASEPLATE DIMENSIONS	ANCHOR BOLTS
BP1	7x7x5/8"	2-5/8"
BP2	7 1/2x8x5/8"	2-5/8"
BP3	-	-

**LINTEL SCHEDULE**

DESIGNATION	SIZE
(1)	W8x24 + L4x3 1/2"x5/16" LLV + GUSSET PL'S
(2)	W8x24 + L5x3 1/2"x3/8" LLV + GUSSET PL'S
(3)	-

**STANDARD ABBREVIATIONS**

1ST	FIRST
2ND	SECOND
3RD	THIRD
A.B.	ANCHOR BOLTS
ANCH.	ANCHORS
ARCH.	ARCHITECTURAL
BOARD	BOARD
B.O.	BOTTOM OF
BOT.	BOTTOM
B.P.L.	BASE PLATE
BRG.	BEARING
C.D.	CENTRELINE
CL.	CLEAR-OUT
CONC.	CONCRETE
CONN.	CONNECTION (CONNECT TO)
CONT.	CONTINUOUS
COL.	COLUMN
C.T.C.	CENTRE TO CENTRE
C/W	COMPLETE WITH
D.	DEPTH
DBL.	DOUBLE
DF.	DRINKING FOUNTAIN
D.F.	DOUGLAS FIR
DF.	DEEP
DTL.	DETAIL
DWG.	DRAWING
D.W.L.	DOWEL
EA.	EACH
EFF.	EFFECTIVE
EQU.	EQUAL
E.W.	EACH WAY
ELEC.	ELECTRICAL
EL.	ELEVATION
ELEV.	ELEVATION
E.P.D.M.	ETHYLENE PROPYLENE DIENE MONOMER
EPS	EXPANDED POLYSTYRENE
EX.	EXISTING
EXIST.	EXISTING
FD.	FLOOR DRAIN
FDN.	FOUNDATION
FHC	FIRE HOSE CABINET
FACE	FACE OF
FTG.	FOOTING
FRP	FIBREGLAS REINFORCED PLASTIC
GR.BM.	GRADE BEAM
GL.	GULLIAM
GWB	GYPSON WALLBOARD
HSPK.	HOUSEKEEPING PAD
HOR.	HORIZONTAL
HORIZ.	HORIZONTAL
H.C.	HOLLOW CORE
H.E.F.	HORIZONTAL EACH FACE
H.(HI.)	HEIGHT
H.I.F.	HORIZONTAL INSIDE FACE
JST.	JOIST
LB.	LENGTH
LG.	LONG
L.L.H.	LONG LEG HORIZONTAL
L.L.V.	LONG LEG VERTICAL
LOC'N.	LOCATION
LONGIT.	LONGITUDINAL
LX.	LEVAN
MAX.	MAXIMUM
MECH.	MECHANICAL
MID.	MIDDLE
MIN.	MINIMUM
MISC.	MISCELLANEOUS
ML.	MICROLAM
MET.	METAL (METALLIC)
N.S.	NEAR SIDE
N.T.S.	NOT TO SCALE
O.C.	ON CENTRE
OPNG.	OPENING
OWSJ	OPEN WEB STEEL JOIST
P.C.(P/C)	PRECAST
PL.	PLATE
P'LAM	PLASTIC LAMINATE
P.L.Y.	PLYWOOD
P.T.	PRESSURE TREATED
PRES.	PRESSURE
PROT.	PROTECTION (BD.)
PVC	POLY-VINYL-CHLORIDE
REF.	REFERENCE (REFER TO)
REINFC.	REINFORCING
REV.	REVISED (REVISION)
R.D.	ROOF DRAIN
R.H.	ROOF HOPPER
R/W	REINFORCED WITH
RTU	ROOF TOP UNIT
RWL	RAIN WATER LEADER
SECT.	SECTION
SHTHG.	SHEATHING
SIM.	SIMILAR
S.S.	STAINLESS STEEL
STRUCT.	STRUCTURAL
ST.	STEEL (OR STUD)
T & B	TOP AND BOTTOM
T & G	TONGUE AND GROOVE
T/O	TRANSVERSE
TYP.	TYPICAL
U/N	UNLESS NOTED
U/S	UNDERSIDE
VERT.	VERTICAL
V.I.F.	VERTICAL INSIDE FACE
V.O.F.	VERTICAL OUTSIDE FACE
W/	WITH
WSD	WORKING STRESS DESIGN
W.W.M.	WELDED WIRE MESH



I HAVE REVIEWED AND TAKEN RESPONSIBILITY FOR THE DESIGN WORK ON BEHALF OF THE WALTER FEDY PARTNERSHIP.

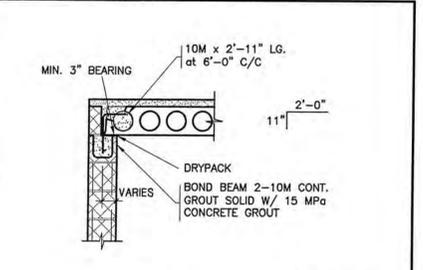
SIGNATURE: *J. Wuohela*

NAME: J. Wuohela

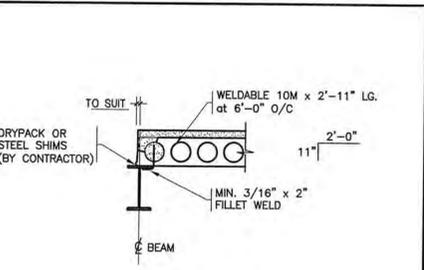
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**GENERAL NOTES**

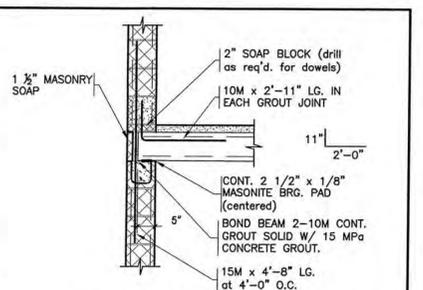
- GENERAL:**
  - ALL DIMENSIONS ON STRUCTURAL DRAWINGS MUST BE VERIFIED WITH ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS. ANY DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.
  - STRUCTURAL DRAWINGS TO BE READ IN CONJUNCTION WITH SPECIFICATIONS AND ALL OTHER CONTRACT DOCUMENTS.
  - REFER TO DRAWINGS FOR SPECIFIED DESIGN LOADS. DESIGN LOADS SHALL NOT BE EXCEEDED DURING CONSTRUCTION.
- MATERIAL:**
  - CONCRETE: CONFORM TO THE REQUIREMENTS OF CAN/CSA-A23.1. REFER TO SPECIFICATION FOR CONCRETE COMPRESSIVE STRENGTH.
  - REINFORCING STEEL SHALL BE NEW BILLET STEEL GRADE 400 AND SHALL BE DETAILED AND PLACED IN ACCORDANCE WITH THE CURRENT MANUAL OF STANDARD PRACTICE OF THE REINFORCING STEEL INSTITUTE OF ONTARIO.
  - STRUCTURAL STEEL: CONFORM TO CAN/CSA-G40.20/G40.21, GRADE 350W. HOLLOW STRUCTURAL SECTIONS (HSS) TO CONFORM TO CAN/CSA-G40.20/G40.21, GRADE 350W, CLASS H.
  - ANCHOR BOLTS: CONFORM TO ASTM A307 OR 300W THREADED ROD CONFORMING TO CSA G40.21-M UNLESS NOTED.
  - STRUCTURAL BOLTS, NUTS AND WASHERS: CONFORM TO ASTM A325
  - CONCRETE MASONRY UNITS: CONFORM TO CAN3-A185 SERIES, 15MPa MINIMUM COMPRESSIVE STRENGTH BASED ON NET AREA.
  - MORTAR: CONFORM TO CSA-A179, TYPE 'S'.
  - MASONRY GROUT: CONFORM TO CSA-A179, 15 MPa MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS. REFER TO SPECIFICATIONS FOR MIX DESIGN REQUIREMENTS.
  - MASONRY TIES: CONFORM TO CSA-A370.
  - FOUNDATION INSULATION: EXTRUDED POLYSTYRENE CONFORMING TO CAN/ULC - 5701-01.
  - STEEL ROOF DECK: 1 1/2" x 0.030" NON-COMPOSITE STEEL ROOF DECK UNLESS NOTED OTHERWISE.
- CONCRETE - SECTION 3:**
  - FOUND ALL FOOTINGS ON NATURAL UNDISTURBED SOIL CAPABLE OF SAFELY SUSTAINING AN UNFACTORED BEARING PRESSURE OF 4000 P.S.F..
  - ALL FOOTINGS MUST BE 4'-0" (MIN.) BELOW FINISHED EXTERIOR GRADES UNLESS EQUIVALENT PROTECTION IS PROVIDED BY INSULATION AS SHOWN IN THE DRAWINGS.
  - FOOTINGS EXPOSED TO FROST ACTION DURING CONSTRUCTION SHALL BE PROTECTED BY 4'-0" OF EARTH OR EQUIVALENT.
  - THE LINE OF SLOPE BETWEEN ADJACENT FOOTINGS OR EXCAVATIONS, OR ALONG STEPPED FOOTINGS SHALL NOT EXCEED A RISE OF 7 IN A RUN OF 10. MAXIMUM STEP SHALL BE 2'-0".
  - NO BACKFILL SHALL BE PLACED AGAINST WALLS (OTHER THAN CANTILEVERED WALLS) UNTIL SUPPORTING FLOORS AND CROSS-WALLS ARE ERRECTED UNLESS ADEQUATE SHORING IS PROVIDED.
  - ALL CONSTRUCTION JOINTS SHALL BE REVIEWED AND APPROVED BY THE ENGINEER UNLESS SHOWN ON THE STRUCTURAL DRAWINGS.
  - ALL SLABS-ON-GRADE SHALL BE 4" CONCRETE SLAB ON GRADE C/W 10M AT 18 O.C. E.W. MID-DEPTH UNLESS NOTED OTHERWISE. MAXIMUM SPACING OF SAWCUT JOINTS TO BE 15'-0".
  - DROP FOOTINGS 12" WHERE RAINWATER LEADERS OCCUR.
- MASONRY - SECTION 4:**
  - ALL MASONRY CONSTRUCTION SHALL CONFORM TO CAN3-A371.
  - PROVIDE LINTELS OVER ALL OPENINGS TO CONSIST OF L-3 1/2x3 1/2x5/16 FOR CLEAR SPANS UP TO 4'-0" OR L-5x3 1/2x5/16 FOR CLEAR SPANS FROM 4'-0" TO 6'-6" FOR EACH 4" THICKNESS OF MASONRY UNLESS NOTED OTHERWISE.
  - PROVIDE A MINIMUM OF 6" BEARING ON MASONRY WALLS FOR STEEL LINTELS AND BEAMS UNLESS NOTED OTHERWISE.
  - ALL MASONRY BELOW STEEL BEARING PLATES SHALL BE FILLED WITH 15 MPa CONCRETE FOR A WIDTH AND DEPTH EQUAL TO 3 TIMES THE LENGTH OF BEARING UNLESS NOTED OTHERWISE.
  - WHERE DOWELS, ANCHOR BOLTS ETC. ARE SHOWN PROJECTING INTO MASONRY, FILL MASONRY CORES WITH MASONRY GROUT.
  - ALL THE CORES IN MASONRY PIERS SHALL BE FILLED WITH 15 MPa CONCRETE GROUT. USE OF MORTAR IS NOT PERMITTED.
  - PROVIDE CONTROL JOINTS AS PER P.C.A. "CONCRETE MASONRY HANDBOOK". MAXIMUM SPACING OF CONTROL JOINTS TO BE 20'-0" UNLESS NOTED OTHERWISE.
- STRUCTURAL STEEL - SECTION 5:**
  - ALL WELDING SHALL CONFORM TO CSA-W59 AND BE PERFORMED BY A FABRICATOR CERTIFIED BY THE CANADIAN WELDING BUREAU TO C.S.A. W47.1 STANDARDS.
  - PROVIDE 6" x 1/2" BEARING PLATES C/W 2-5/8" ANCHORS AT ALL LOCATIONS WHERE STEEL BEARS ON MASONRY UNITS OR CONCRETE UNLESS OTHERWISE NOTED. THE WIDTH OF BEARING PLATES SHALL BE THE SAME AS THE MASONRY UNITS OR CONCRETE.
  - PROVIDE WELDED WEB STIFFENER PLATES ON BOTH SIDES OF THE WEB OF BEAMS AT POINTS OF CONCENTRATED LOADS INCLUDING BEAMS SUPPORTING COLUMNS OR RUNNING OVER COLUMNS.
  - PROVIDE JOIST BRIDGING AND ANCHORAGE TO THE CURRENT VERSION OF C.S.A. S16-01.
  - ALL BEARING PLATES AND BASEPLATES ON CONCRETE ARE TO BEAR ON 2" NON-SHRINK GROUT.
- DESIGN:**
  - THE STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH REQUIREMENTS OF 1997 ONTARIO BUILDING CODE AND 1995 NATIONAL BUILDING CODE OF CANADA.
  - ALL STRUCTURAL MASONRY ELEMENTS HAVE BEEN DESIGNED IN ACCORDANCE WITH CSA-S304.1.
  - ALL REINFORCED CONCRETE ELEMENTS HAVE BEEN DESIGNED IN ACCORDANCE WITH CSA-A23.3.
  - ALL STRUCTURAL STEEL ELEMENTS HAVE BEEN DESIGNED IN ACCORDANCE WITH CAN/CSA-S16-01.
  - SPECIFIED DESIGN LOADS (UNFACTORED):
    - ROOF:
      - DEAD LOAD = 20 P.S.F.
      - CONC. SLAB DEAD LOAD = 100 P.S.F.
      - LIVE LOAD = 38 P.S.F. + SNOW BUILD-UP AS SHOWN.
      - UPLIFT = 16 P.S.F.
    - FLOORS:
      - DEAD LOAD = 20 P.S.F.
      - PARTITION S.D.L. = 20 P.S.F.
      - TYPICAL LIVE LOAD = 40 P.S.F.
      - KITCHENS AND DINING AREAS = 100 P.S.F.
      - CORRIDORS, EXITS AND FIRE ESCAPES = 100 P.S.F.
      - ASSEMBLY AREAS = 100 P.S.F.
      - STORAGE AREAS = 100 P.S.F.
    - WIND:
      - q<sub>w</sub> = 7.1 P.S.F., q<sub>v</sub> = 5.6 P.S.F.
    - SEISMIC:
      - Z<sub>e</sub> = 1, Z<sub>s</sub> = 0, v = 0.05



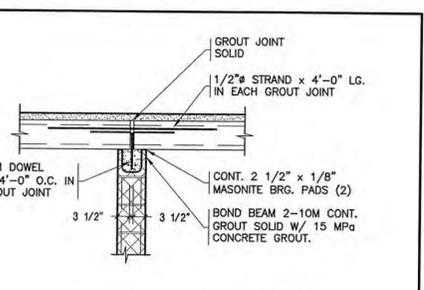
**25 PRECAST SIDE BEARING AT INTERIOR MASONRY WALL**  
S2-3 1/2"=1'-0"



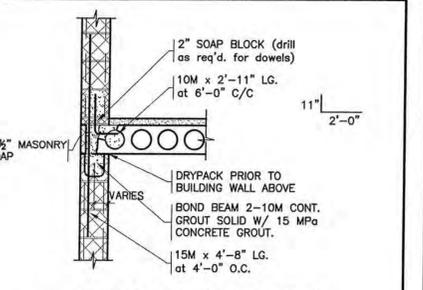
**30 SIDE BEARING AT STEEL BEAMS**  
S2-3 1/2"=1'-0"



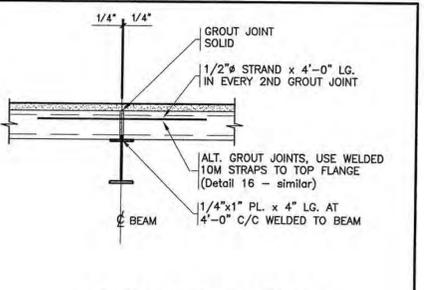
**26 PRECAST END BEARING AT INTERIOR OPENINGS**  
S2-3 1/2"=1'-0"



**31 END-TO-END ABUTMENT AT MASONRY WALL**  
S2-3 1/2"=1'-0"



**27 PRECAST SIDE BEARING MASONRY - MULTI-FLOOR**  
S2-3 1/2"=1'-0"



**32 END-TO-END ABUTMENT AT STEEL BEAMS**  
S2-3 1/2"=1'-0"

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customer

YWCA  
84 FREDERICK STREET  
KITCHENER, ONTARIO

project

YWCA RENEWAL  
84 FREDERICK STREET  
KITCHENER, ONTARIO

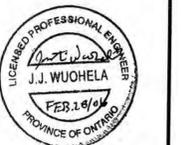
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GENERAL NOTES  
AND DETAILS

THE WALTER FEDY PARTNERSHIP ARCHITECTS • ENGINEERS

546 Belmont Ave., Kitchener, Ontario, N2M 5E3  
P. 519-576-2150 F. 519-576-5499 www.wfp.com

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scale: 1/8"=1'-0"

date: JAN 4/06

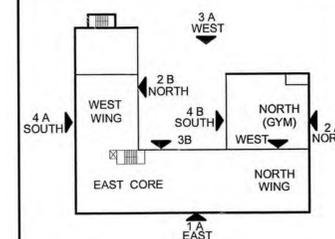
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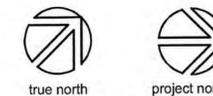
drawn by: MLB

checked by:

BCIN: sheet no.: **S1-2**



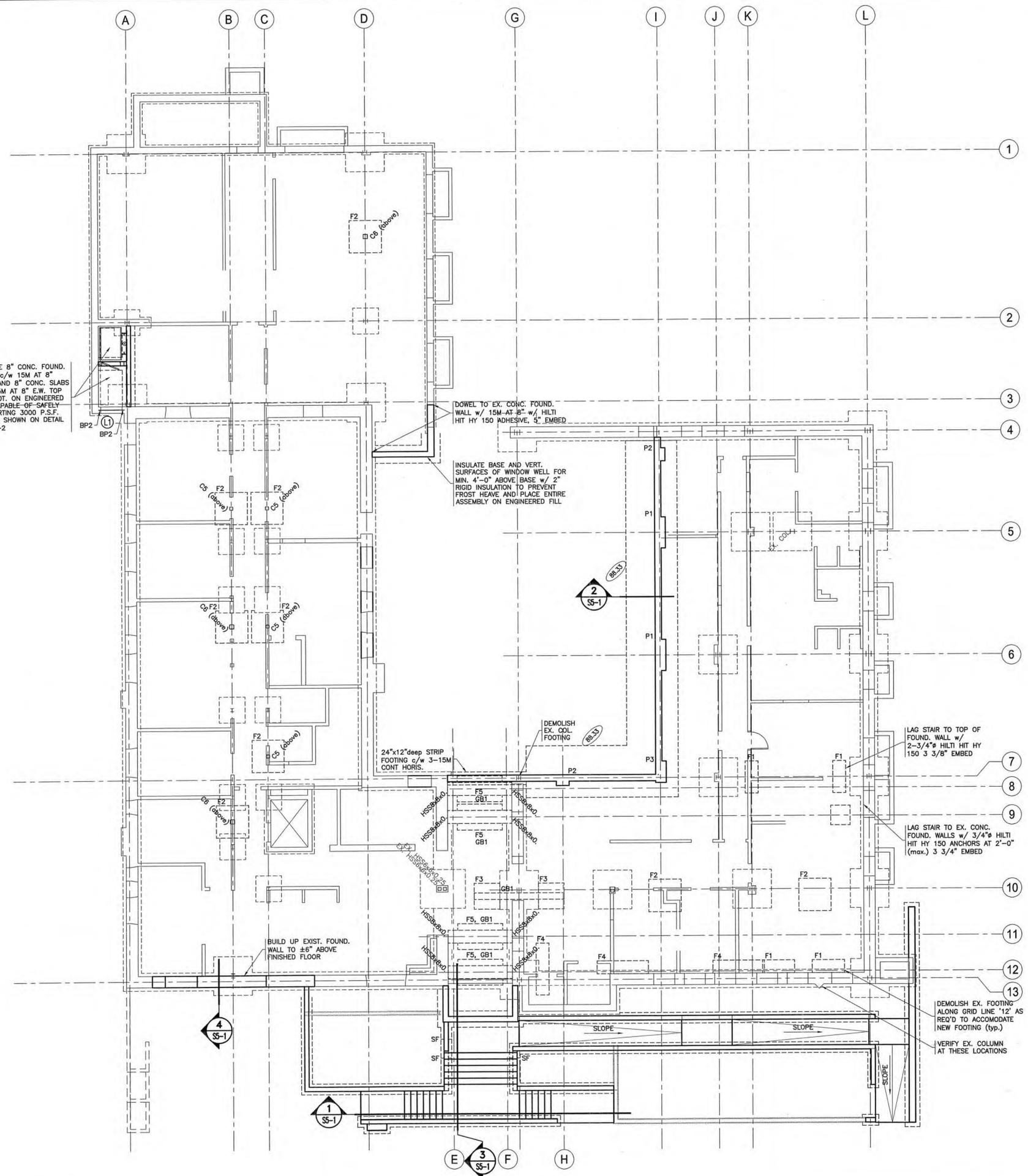
KEYPLAN



I HAVE REVIEWED AND TAKEN RESPONSIBILITY FOR THE DESIGN WORK ON BEHALF OF THE WALTER FEDY PARTNERSHIP.

SIGNATURE *J.J. Wuohela*  
NAME J. J. WUOHELA  
BCIN 22046

PROVIDE 8" CONC. FOUND. WALLS c/w 15M AT 8" E/W AND 8" CONC. SLABS c/w 15M AT 8" E.W. TOP AND BOT. ON ENGINEERED FILL CAPABLE OF SAFELY SUPPORTING 3000 P.S.F. ALL AS SHOWN ON DETAIL 2c/M-2



**FOUNDATION PLAN**

1/8"=1'-0"

**NOTES:**

1. FINISHED EXISTING BASEMENT FLOOR AT EL. 89'-0".
2. EXISTING STRUCTURAL INFORMATION IS BASED ON LIMITED STRUCTURAL DRAWINGS OF THE EXISTING BUILDING AND LIMITED STRUCTURAL SAMPLING/INVESTIGATION THEREFORE ALL EXISTING FOUNDATIONS TO BE FIELD VERIFIED FOR LOCATION AND SIZE. REPORT ANY INCONSISTENCIES TO STRUCTURAL ENGINEER.
3. SEE DRAWING S1-2 FOR COLUMN BASEPLATE SCHEDULE.
4. PATCH ALL AREAS OF REMOVED SLAB-ON-GRADE w/ 5" SLAB-ON-GRADE c/w 15M AT 12" o/c AND DOWEL TO EX. SLAB-ON-GRADE w/ 10M AT 12" DOWELS AND HILTI HIT HY 150 ADHESIVE 4" EMBED.
5. PROVIDE HOOKS ON ALL HORIZ. FOOTING REINFORCING.
6. ALL FOOTING BEARING ELEVATIONS TO MATCH ADJACENT EX. FOOTINGS (field verify).
7. AT ADJACENT FOOTINGS USE A 7:10 SLOPE OF SOIL.
8. WHERE UNDERPINNING USE A 7:10 SLOPE OF SOIL. UNDERPIN IN ALTERNATING 4'-0" SECTIONS AS PER STANDARD INDUSTRY PRACTICE. SUBMIT UNDERPINNING DETAIL FOR APPROVAL BY STRUCTURAL ENGINEER PRIOR TO COMMENCING ANY UNDERPINNING.

**GRADE BEAM SCHEDULE**

MARK	SIZE	REINFORCING
GB1	2'-0" (wide) x 1'-0" (deep)	5-30M TOP AND BOT.

PROVIDE 10M AT 8" (max.) HOOKED DOWELS E.F. INTO FOOTINGS (hooks both ends)

**FOOTING SCHEDULE**

MARK	SIZE	REINFORCING
F1	5'-0" x 2'-0" x 24"	7-15M LONG TOP AND BOT. AND 18-10M SHORT TOP AND BOT.
F2	5'-0" x 5'-0" x 18"	8-20M E.W. BOT.
F3	4'-0" x 4'-0" x 16"	7-20M E.W. BOT.
F4	8'-0" x 2'-0" x 24"	7-20M LONG TOP AND BOT. AND 30-10M SHORT TOP AND BOT.
F5	7'-0" x 4'-0" x 24"	5-15M LONG TOP AND BOT. AND 26-10M SHORT TOP AND BOT.
F6	3'-0" x 3'-0" x 12"	10M AT 6" E.W. BOT.
F7	3'-6" x 7'-0" x 18"	11-20M SHORT BOT. AND 6-25M LONG BOT.

**PIER SCHEDULE**

MARK	SIZE	REINFORCING
P1	1'-8" x 4'-10"	14-30M AND 10M TIES AT 12" o/c (2 sets)
P2	1'-8" x 2'-0"	8-30M AND 10M TIES AT 12" o/c (3 sets)
P3	1'-8" x 3'-4"	14-25M AND 10M TIES AT 12" o/c (2 sets)

**PIER NOTES:**

1. TERMINATE PIERS AT 4" BELOW FINISHED FLOOR U.N.O. ALLOW FOR 2" OF NON-METALLIC, NON-SHRINK GROUT UNDER BASE PLATE.
2. DOWEL PIER CAGES TO ADJACENT FOUNDATION WALLS WITH 2-15M DOWELS AT 12" VERTICAL.
3. PROVIDE DOUBLE TIES AT TOP AND BOT. OF ALL PIERS.

FEB. 28/06 ISSUED FOR BUILDING PERMIT

date revisions

customer

YWCA  
84 FREDERICK STREET  
KITCHENER, ONTARIO

project

YWCA RENEWAL  
84 FREDERICK STREET  
KITCHENER, ONTARIO

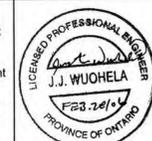
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FOUNDATION PLAN

**THE walterfedy PARTNERSHIP**  
ARCHITECTS • ENGINEERS

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scale: 1/8"=1'-0"

date: JAN 4/06

job no.: 2004-0433-10

CAD file: S2-1\_2004-0433-10

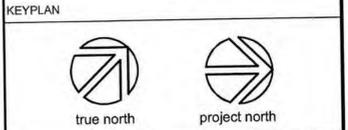
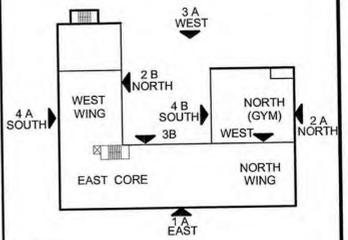
drawn by: MLB

checked by:

BCIN:

sheet no.:

**S2-1**



I HAVE REVIEWED AND TAKEN RESPONSIBILITY FOR THE DESIGN WORK ON BEHALF OF THE WALTER FEDY PARTNERSHIP.

SIGNATURE *J. Wuohela*

NAME **J. WUOHELA**

BCIN **22046**

**GROUND FLOOR FRAMING PLAN**  
1/8"=1'-0"

- NOTES:
1. FINISHED EXISTING 2 1/2" CONCRETE SLAB GROUND FLOOR AT EL. 100'-0".
  2. EXISTING STRUCTURAL INFORMATION IS BASED ON STRUCTURAL DRAWINGS OF THE EXISTING BUILDING AND LIMITED STRUCTURAL SAMPLING/INVESTIGATION THEREFORE ALL EXISTING FRAMING TO BE FIELD VERIFIED FOR MEMBER CONN. CONDITION, LOCATION AND SIZE. REPORT ANY INCONSISTENCIES TO STRUCTURAL ENGINEER PRIOR TO ANY MODIFICATIONS.
  3. SEE DRAWING S2-1 FOR FOOTING AND PIER SCHEDULES. SEE DRAWING S1-2 FOR ALL OTHER SCHEDULES.
  4. DOUBLE UP JOISTS BELOW ALL KITCHEN, DINNING ROOM AND STORAGE AREAS.

FEB. 28/06 ISSUED FOR BUILDING PERMIT  
date revisions

customer  
**YWCA**  
84 FREDERICK STREET  
KITCHENER, ONTARIO

project  
**YWCA RENEWAL**  
84 FREDERICK STREET  
KITCHENER, ONTARIO

**GROUND FLOOR FRAMING PLAN**



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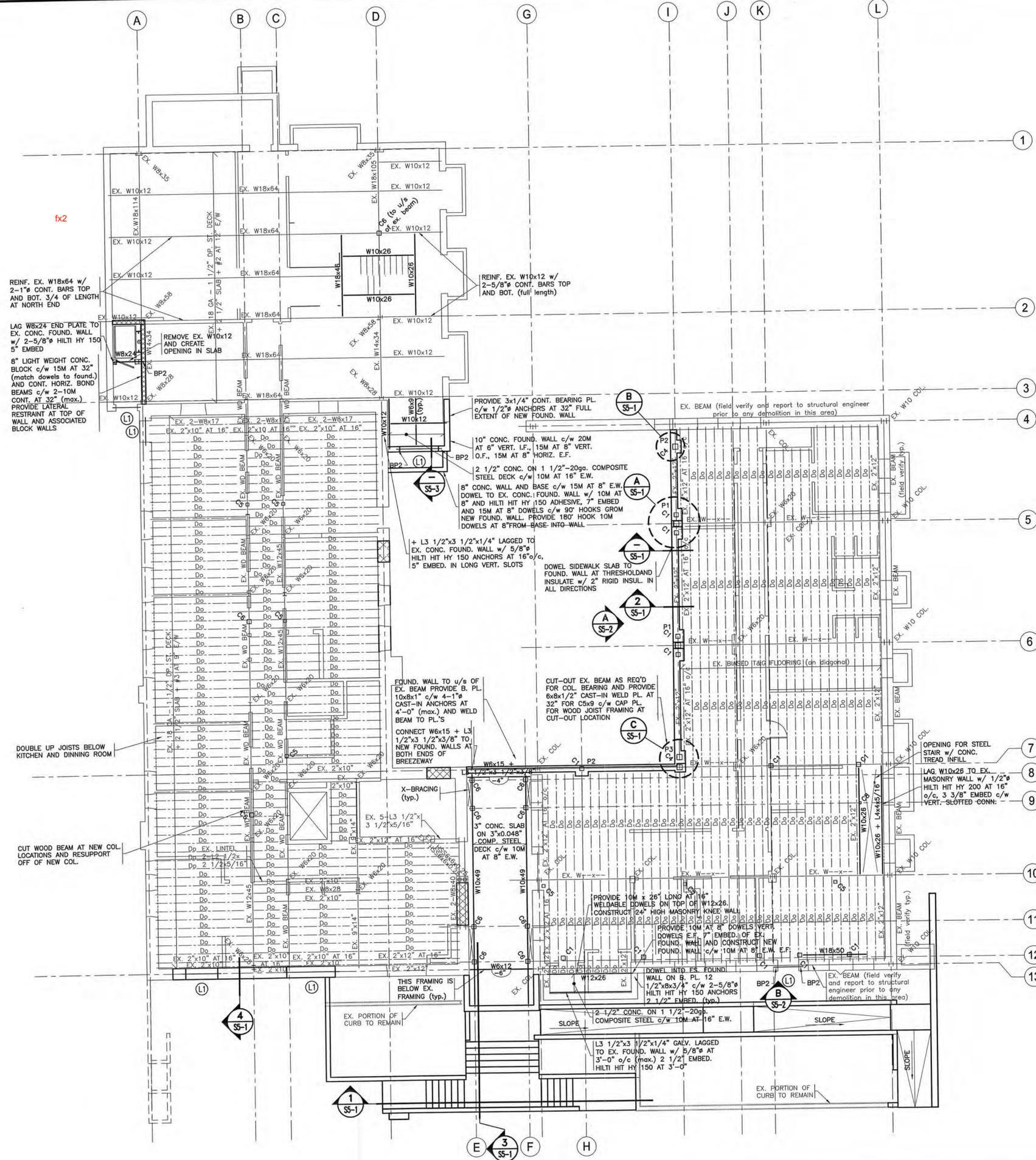
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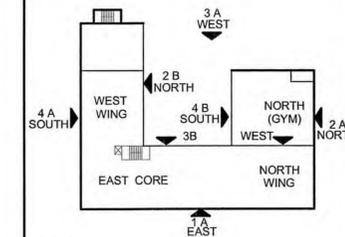


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scale: 1/8"=1'-0"  
date: JAN 4/06  
job no.: 2004-0433-10  
CAD file: S2-2\_2004-0433-10  
drawn by: M.L.B.  
checked by:

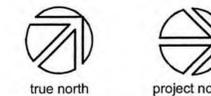
BCIN sheet no.:

**S2-2**





KEY PLAN



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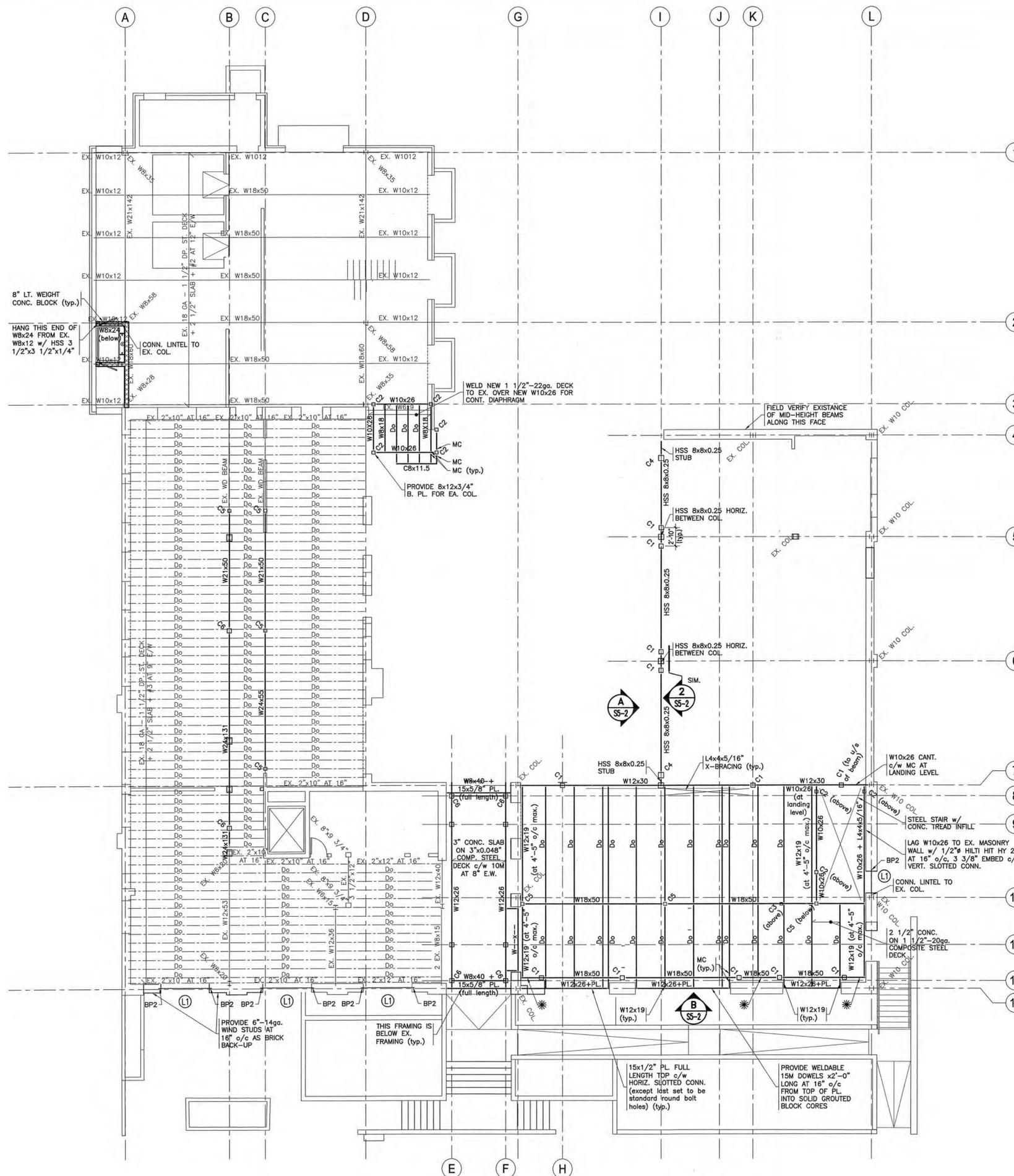
SIGNATURE *J. Wuohela*  
NAME J. Wuohela  
BCIN 22 046

**SECOND FLOOR FRAMING PLAN**

1/8"=1'-0"

NOTES:

1. FINISHED EXISTING SECOND FLOOR AT EL. 110'-0".
2. EXISTING STRUCTURAL INFORMATION IS BASED ON STRUCTURAL DRAWINGS OF THE EXISTING BUILDING AND LIMITED STRUCTURAL SAMPLING/INVESTIGATION THEREFORE ALL EXISTING FRAMING TO BE FIELD VERIFIED FOR MEMBER CONN. CONDITION, LOCATION AND SIZE. REPORT ANY INCONSISTENCIES TO STRUCTURAL ENGINEER PRIOR TO ANY MODIFICATIONS.
3. SEE DRAWING S1-2 FOR ALL SCHEDULES.
4. MC=FULL STRENGTH MOMENT CONNECTION.
5. LAG TO MASONRY w/ HILTI HIT HY SHOWN THUS: \* c/w VERTICAL SLOTTED CONNECTIONS.
6. ALL WINDLOAD STUDS TO BE 6"-18ga. U.N.O.



FEB. 28/06	ISSUED FOR BUILDING PERMIT
date	revisions
customer	YWCA 84 FREDERICK STREET KITCHENER, ONTARIO
project	YWCA RENEWAL 84 FREDERICK STREET KITCHENER, ONTARIO
title	SECOND FLOOR FRAMING PLAN

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ARCHITECTS • ENGINEERS

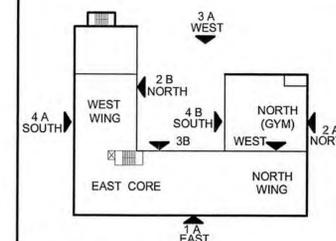
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job no.: 2004-0433-10  
CAD file: S2-3\_2004-0433-10  
drawn by: M.L.B.  
checked by:

BCIN: 22 046  
sheet no.: **S2-3**



KEYPLAN



I HAVE REVIEWED AND TAKEN RESPONSIBILITY FOR THE DESIGN WORK ON BEHALF OF THE WALTER FEDY PARTNERSHIP.

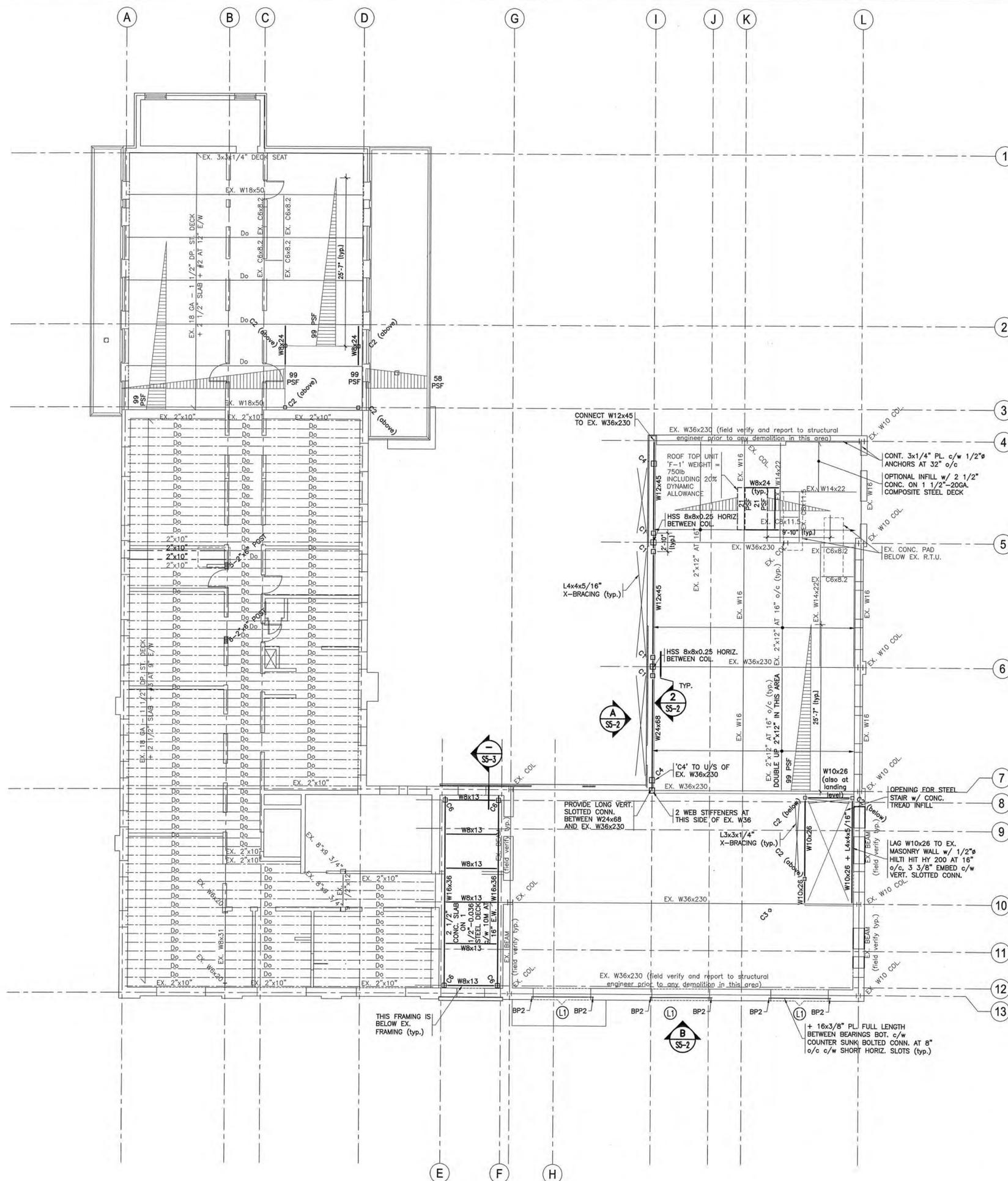
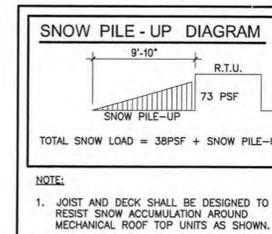
SIGNATURE: *J. Wuohela*  
NAME: J. WUOHELA  
BCIN: 27046

**THIRD FLOOR FRAMING PLAN**

1/8"=1'-0"

NOTES:

1. FINISHED THIRD FLOOR FRAMING AT EL. 120'-0".
2. EXISTING STRUCTURAL INFORMATION IS BASED ON STRUCTURAL DRAWINGS OF THE EXISTING BUILDING AND LIMITED STRUCTURAL SAMPLING/INVESTIGATION THEREFORE ALL EXISTING FRAMING TO BE FIELD VERIFIED FOR MEMBER CONN. CONDITION, LOCATION AND SIZE. REPORT ANY INCONSISTENCIES TO STRUCTURAL ENGINEER PRIOR TO ANY MODIFICATIONS.
3. SEE DRAWING S1-2 FOR ALL SCHEDULES.



FEB. 28/08 ISSUED FOR BUILDING PERMIT

customer

YWCA  
84 FREDERICK STREET  
KITCHENER, ONTARIO

project  
YWCA RENEWAL  
84 FREDERICK STREET  
KITCHENER, ONTARIO

title  
THIRD FLOOR FRAMING PLAN

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ARCHITECTS • ENGINEERS

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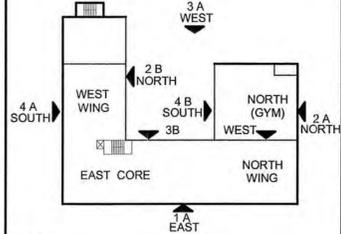
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date: JAN 4/06  
job no.: 2004-0433-10  
CAD file: S2-4\_2004-0433-10  
drawn by: MLB  
checked by:

BCIN: sheet no.: **S2-4**





KEYPLAN

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SIGNATURE *J. Wuohela*  
NAME J. WUOHELA  
BCIN 22046

FEB. 28/06 ISSUED FOR BUILDING PERMIT  
date revisions

customer  
**YWCA**  
84 FREDERICK STREET  
KITCHENER, ONTARIO

project  
**YWCA RENEWAL**  
84 FREDERICK STREET  
KITCHENER, ONTARIO

title  
**FOUNDATION SECTIONS**

**THE Walterfedy PARTNERSHIP**  
ARCHITECTS • ENGINEERS

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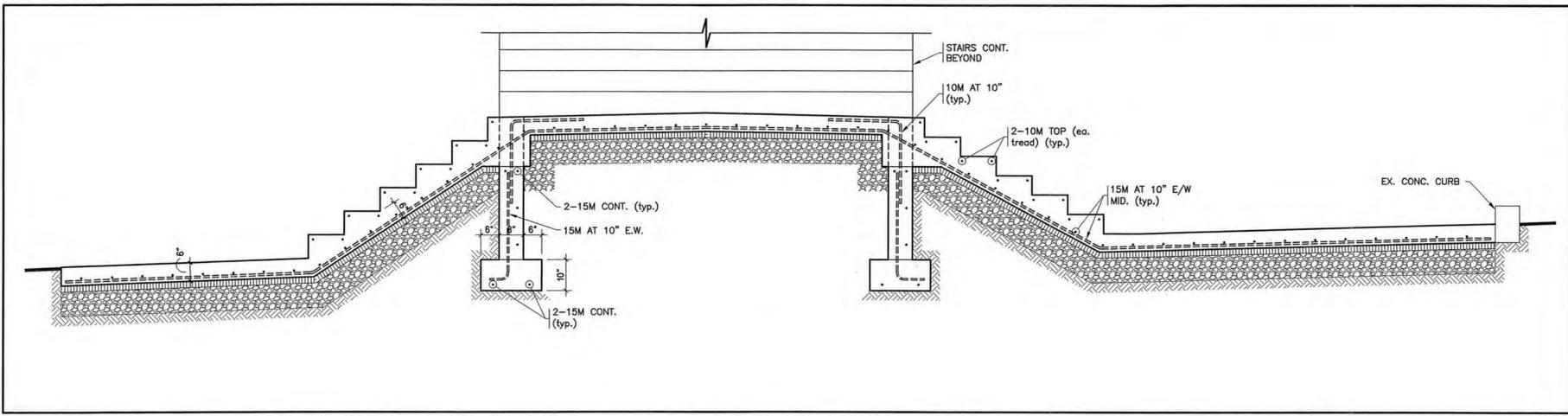
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LICENSED PROFESSIONAL ENGINEER  
*J.J. WUOHELA*  
FEB 18/06  
PROVINCE OF ONTARIO

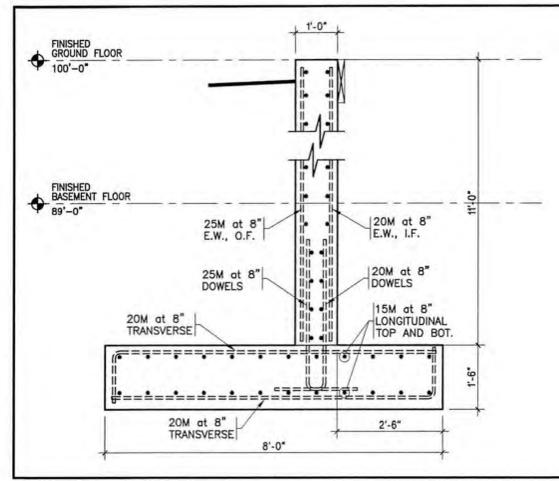
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date: JAN 4/05  
job no.: 2004-0433-10  
CAD file: S5-1\_2004-0433-10  
drawn by: MLB  
checked by:

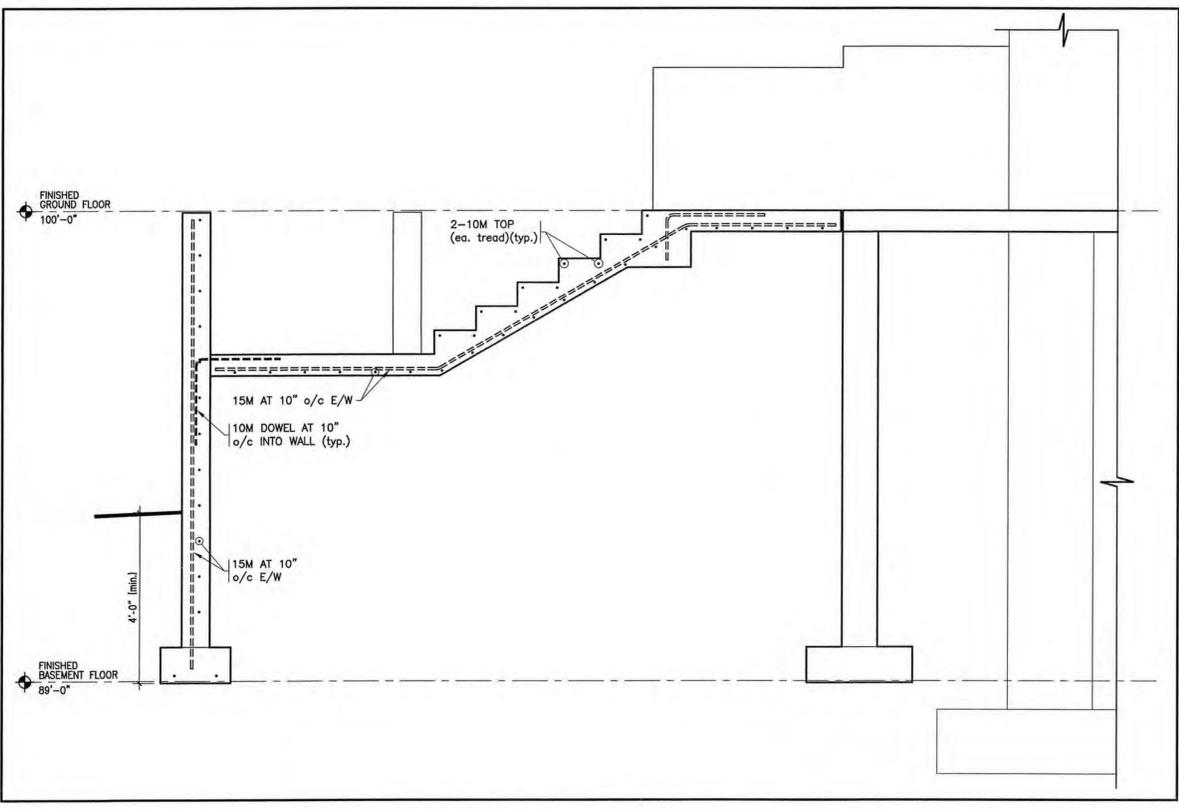
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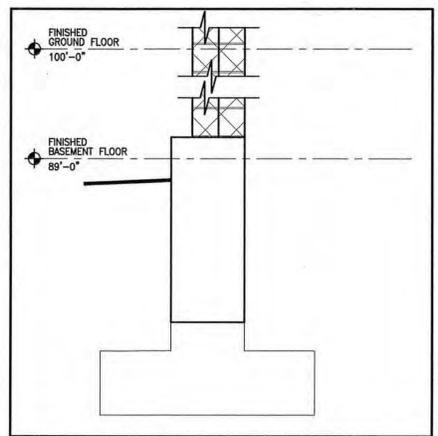
**1** SECTION AT EXTERIOR STAIR AT MAIN ENTRANCE  
S2-1 1/2"=1'-0"



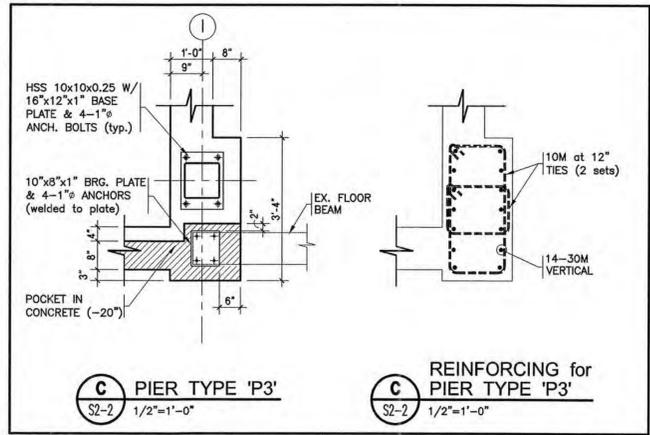
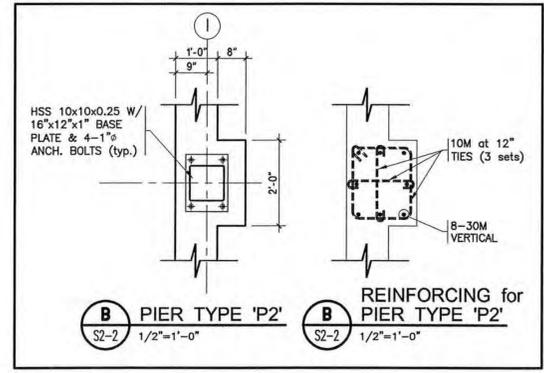
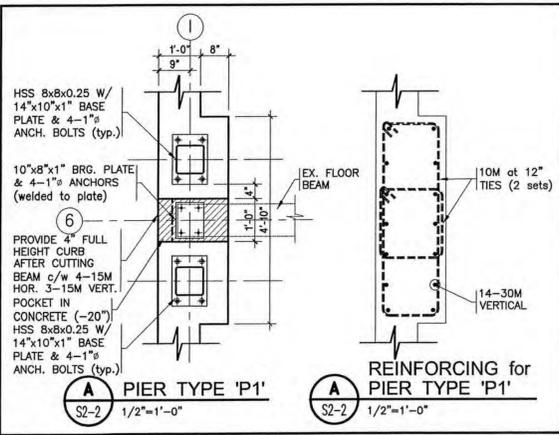
**2** SECTION AT TYP. COURTYARD RETAINING WALL  
S2-1 1/2"=1'-0"

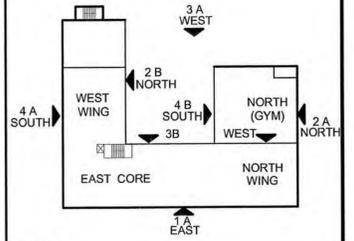


**3** SECTION AT EXTERIOR STAIR AND THRU MAIN ENTRANCE  
S2-1 1/2"=1'-0"



**4** SECTION AT REMOVED EX. STAIR  
S2-1 1/2"=1'-0"





KEYPLAN

I HAVE REVIEWED AND TAKEN RESPONSIBILITY FOR THE DESIGN WORK ON BEHALF OF THE WALTER FEDY PARTNERSHIP.

SIGNATURE *J. Wuohela*  
NAME J. WUOHELA  
BCIN 22046

FEB. 28/06 ISSUED FOR BUILDING PERMIT  
date revisions

customer  
**YWCA**  
84 FREDERICK STREET  
KITCHENER, ONTARIO

project  
**YWCA RENEWAL**  
84 FREDERICK STREET  
KITCHENER, ONTARIO

title  
**SECTIONS, DETAILS AND ELEVATIONS**

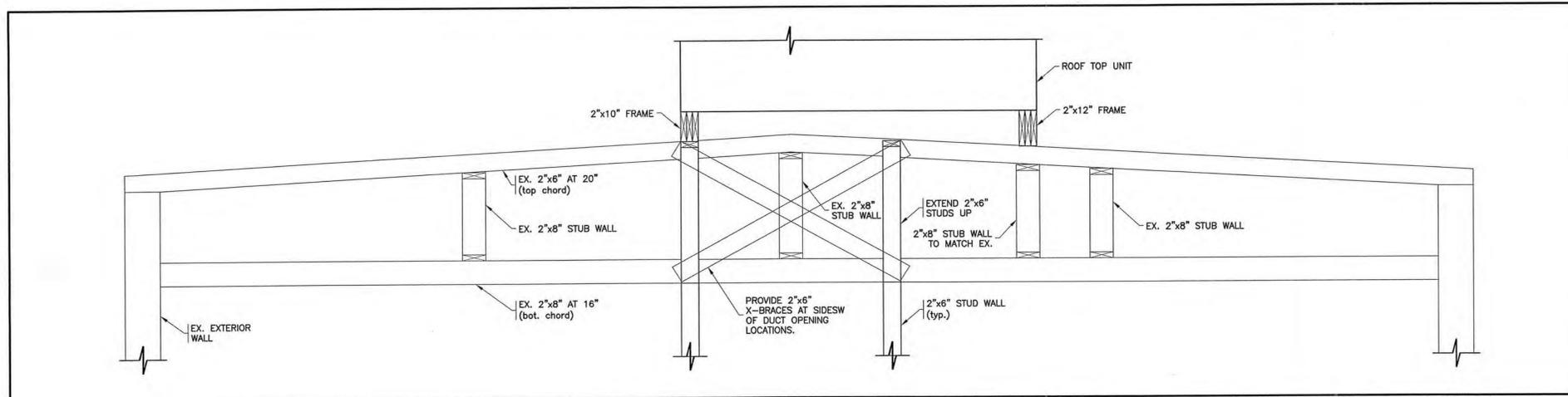
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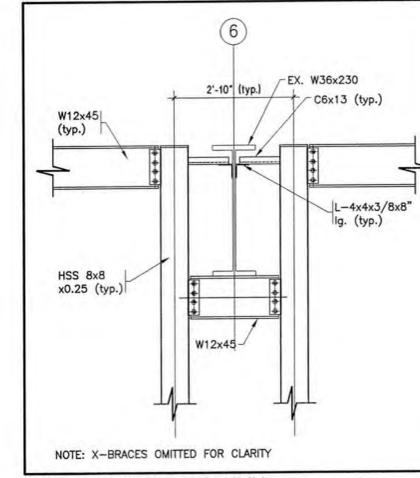


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date: JAN 4/05  
job no.: 2004-0433-10  
CAD file: S5-2\_2004-0433-10  
drawn by: MLB  
checked by:

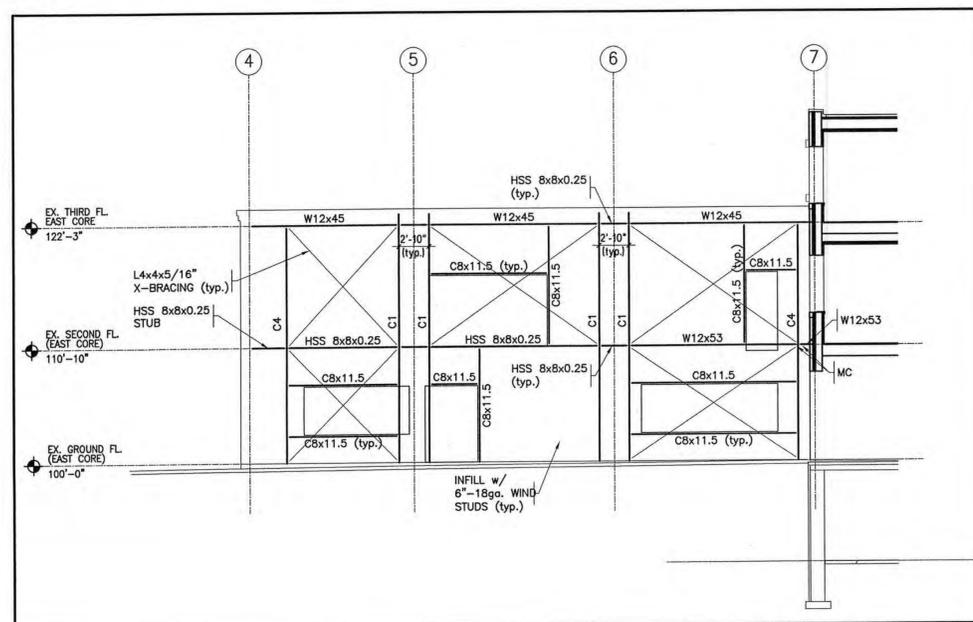
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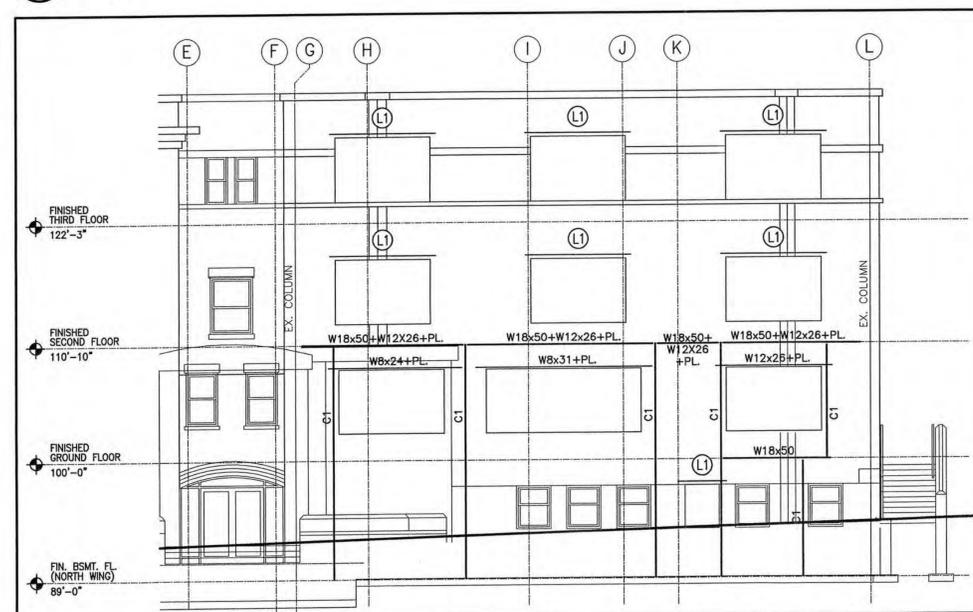
**1** SECTION AT FRAMING FOR ROOF TOP UNIT (THIRD FLOOR ROOF)  
S2-5 1/2"=1'-0"



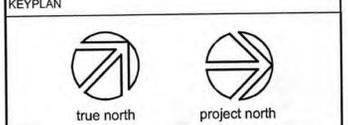
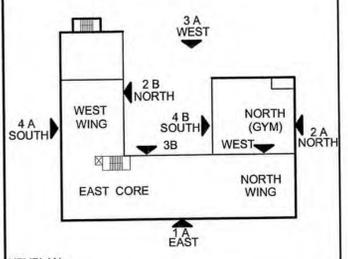
**2** NEW HSS COLUMN TO EX. W36x230 CONNECTION  
S2-4 1/2"=1'-0"



**A** SOUTH ELEVATION OF GYM  
S2-1 1/8"=1'-0"



**B** PARTIAL EAST ELEVATION  
S2-1 1/8"=1'-0"



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SIGNATURE: *E. J. Fowler*  
NAME: **Ed Fowler**  
BCIN: **21019**

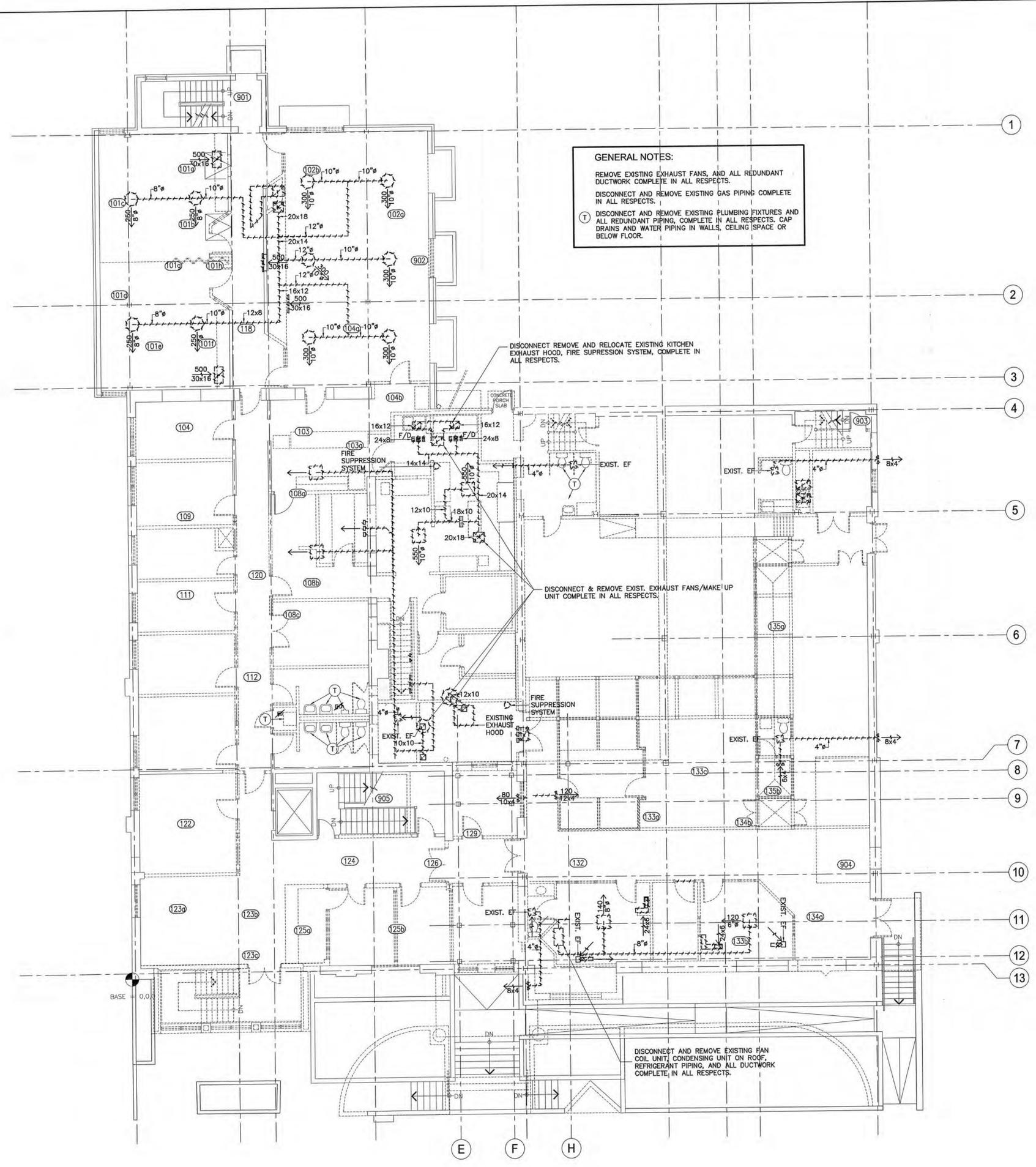
*Basement Floor  
Plan  
Demolition Layout*

**GENERAL NOTES:**  
REMOVE EXISTING EXHAUST FANS, AND ALL REDUNDANT DUCTWORK COMPLETE IN ALL RESPECTS.  
DISCONNECT AND REMOVE EXISTING GAS PIPING COMPLETE IN ALL RESPECTS.  
DISCONNECT AND REMOVE EXISTING PLUMBING FIXTURES AND ALL REDUNDANT PIPING, COMPLETE IN ALL RESPECTS. CAP DRAINS AND WATER PIPING IN WALLS, CEILING SPACE OR BELOW FLOOR.

DISCONNECT REMOVE AND RELOCATE EXISTING KITCHEN EXHAUST HOOD, FIRE SUPPRESSION SYSTEM, COMPLETE IN ALL RESPECTS.

DISCONNECT & REMOVE EXIST. EXHAUST FANS/MAKE UP UNIT COMPLETE IN ALL RESPECTS.

DISCONNECT AND REMOVE EXISTING FAN COIL UNIT, CONDENSING UNIT ON ROOF, REFRIGERANT PIPING, AND ALL DUCTWORK COMPLETE, IN ALL RESPECTS.



FEB 28/06 ISSUED FOR BUILDING PERMIT  
date revisions

customer  
**YWCA  
84 FREDERICK STREET  
KITCHENER, ONTARIO**

project  
**YWCA RENEWAL  
845 FREDERICK STREET  
KITCHENER, ONTARIO**

title  
**GROUND FLOOR PLAN  
DEMOLITION LAYOUT**

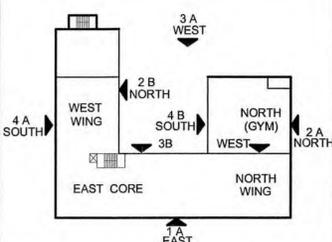
**THE walterfedy PARTNERSHIP**  
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546 Belmont Ave. W., Kitchener, Ontario, N2M 5E3  
P: 519-576-2150 F: 519-576-5499 www.twfp.com

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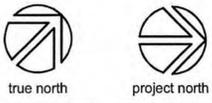


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job no.: 2004-0433-10  
CAD file: M2-2\_2004-0433-10  
drawn by: CR  
checked by:

sheet no.: **MD-2**



KEYPLAN



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SIGNATURE *EJ Fowler*  
 NAME EJ Fowler  
 BCIN 21019

date	revisions
FEB 28/06	ISSUED FOR BUILDING PERMIT

customer  
**YWCA**  
 84 FREDERICK STREET  
 KITCHENER, ONTARIO

project  
**YWCA RENEWAL**  
 845 FREDERICK STREET  
 KITCHENER, ONTARIO

title  
**SECOND FLOOR PLAN  
 DEMOLITION LAYOUT**

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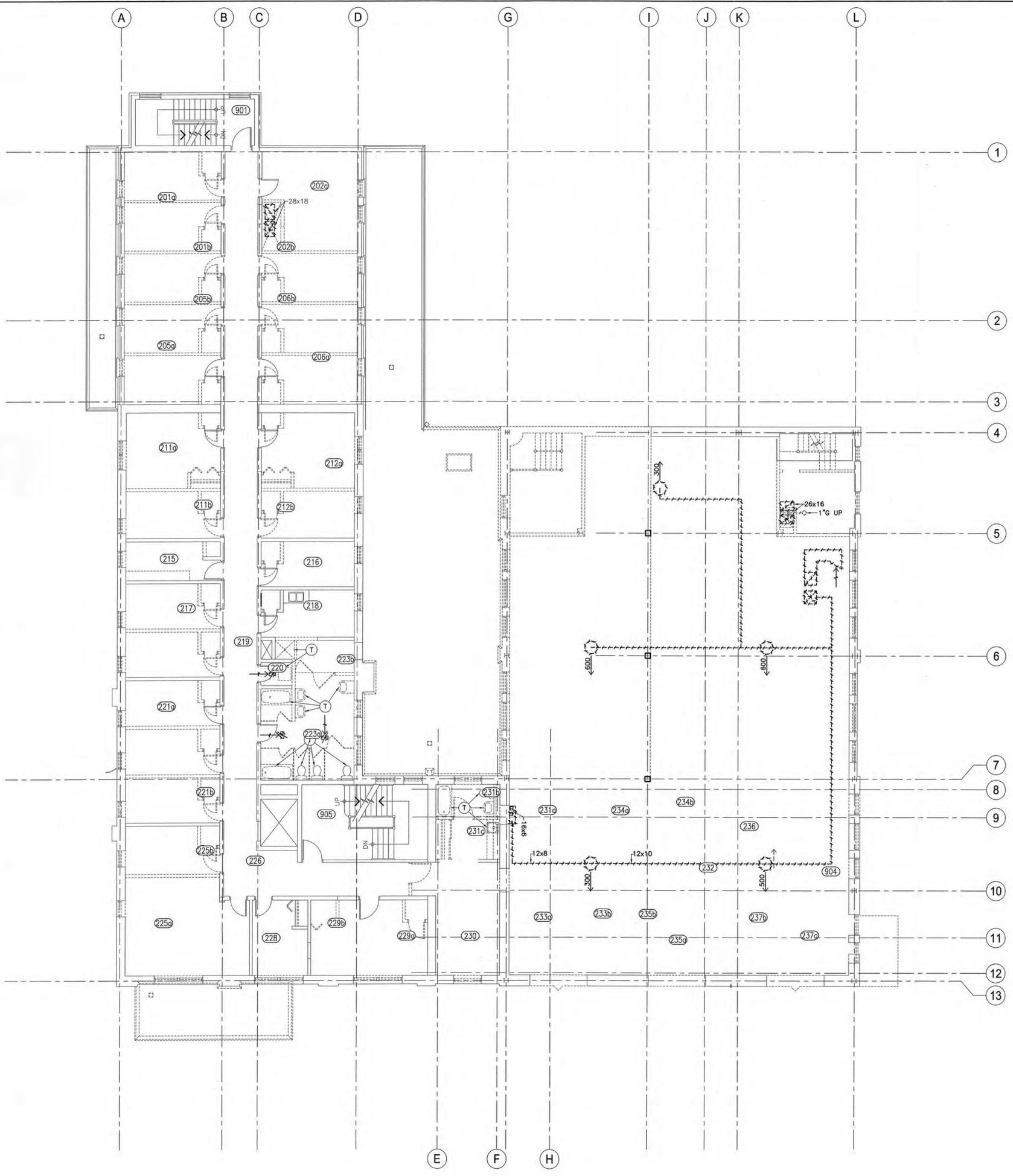
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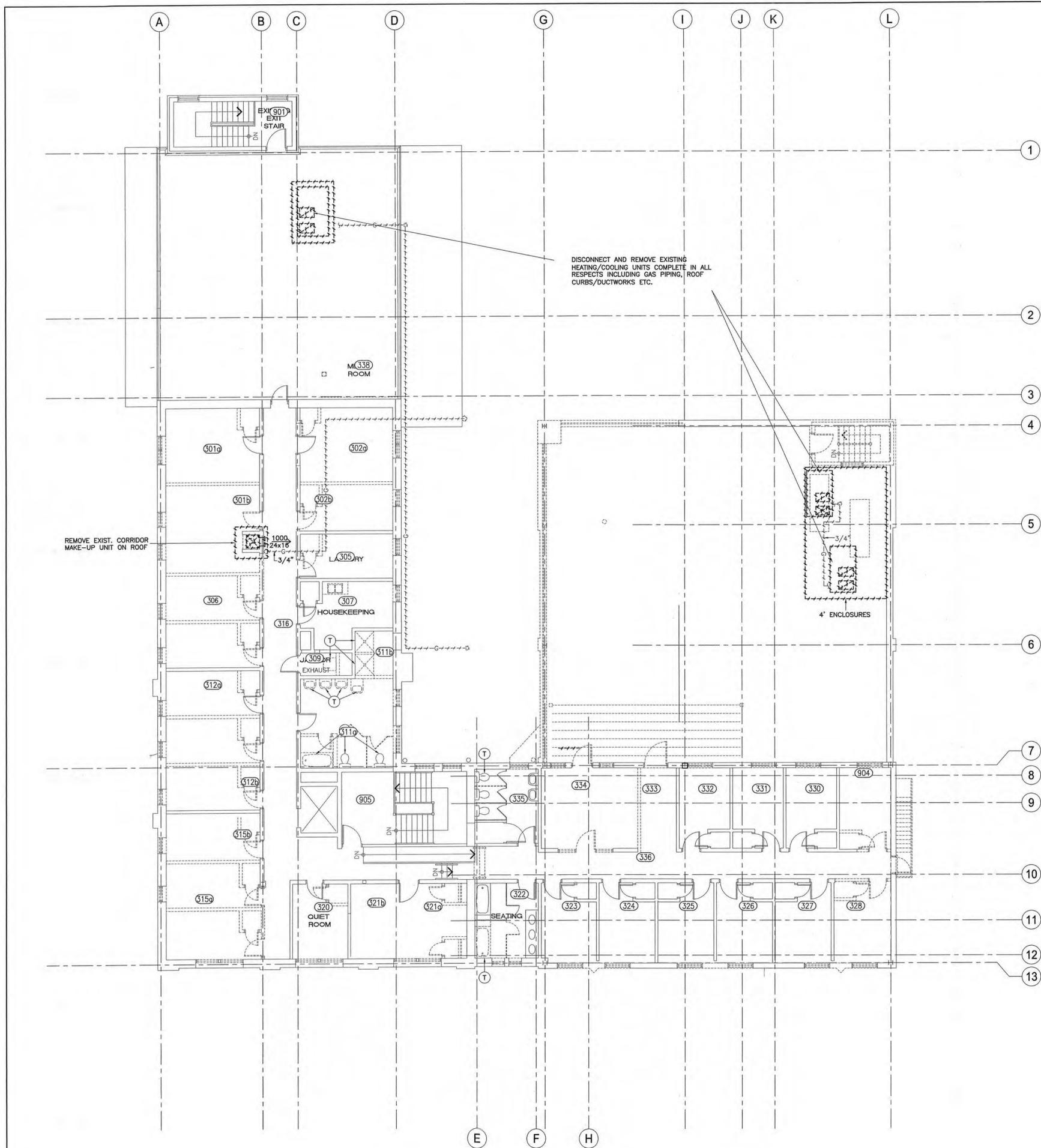


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 date: OCT 27/05  
 job no.: 2004-0433-10  
 CAD file: M2-3\_2004-0433-10  
 drawn by: CR  
 checked by:

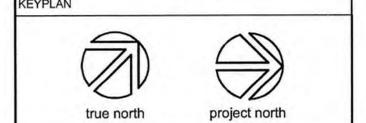
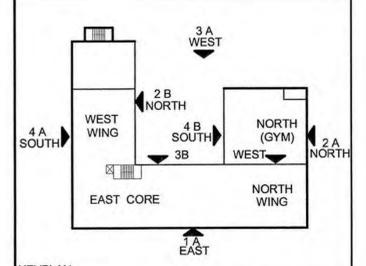
BCIN:  
 sheet no.:  
**MD-3**





DISCONNECT AND REMOVE EXISTING HEATING/COOLING UNITS COMPLETE IN ALL RESPECTS INCLUDING GAS PIPING, ROOF CURBS/DUCTWORKS ETC.

REMOVE EXIST. CORRIDOR MAKE-UP UNIT ON ROOF



I HAVE REVIEWED AND TAKEN RESPONSIBILITY FOR THE DESIGN WORK ON BEHALF OF THE WALTER FEDY PARTNERSHIP.

SIGNATURE *EJF*  
 NAME Ed Fowler  
 BCIN 21019

FEB 26/06 ISSUED FOR BUILDING PERMIT  
 date revisions

customer  
 YWCA  
 84 FREDERICK STREET  
 KITCHENER, ONTARIO

project  
 YWCA RENEWAL  
 845 FREDERICK STREET  
 KITCHENER, ONTARIO

title  
 THIRD FLOOR PLAN  
 DEMOLITION LAYOUT



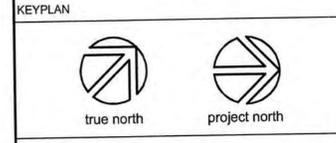
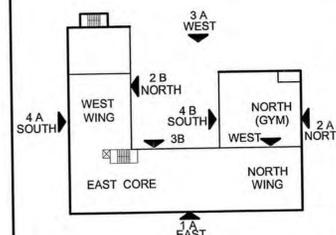
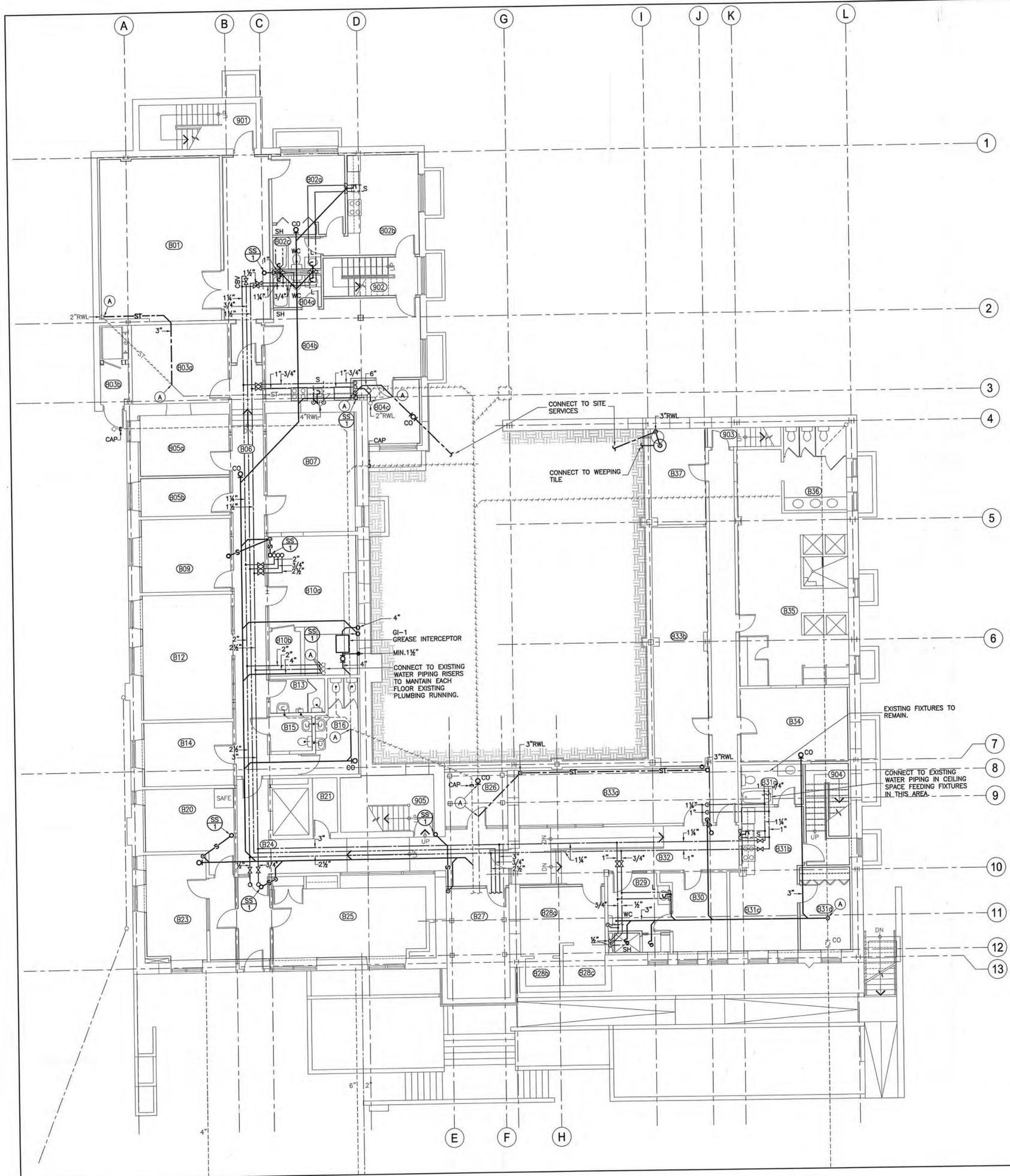
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 drawn by: CR  
 checked by:

BCIN: sheet no.:  
**MD-4**





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SIGNATURE *EJ Fowler*

NAME ED FOWLER

BCIN 21019

FEB 28/06 ISSUED FOR BUILDING PERMIT

customer **YWCA**  
84 FREDERICK STREET  
KITCHENER, ONTARIO

project **YWCA RENEWAL**  
845 FREDERICK STREET  
KITCHENER, ONTARIO

title **BASEMENT FLOOR PLAN**  
**PLUMBING LAYOUT**

**THE walterfedy PARTNERSHIP**  
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date: FEB. 2005

job no.: 2004-0433-10

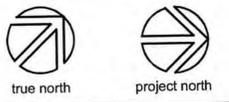
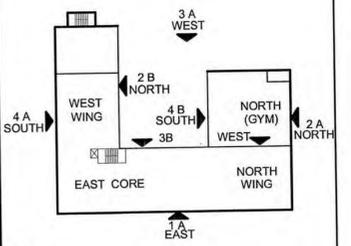
CAD file: M2-1\_2004043310

drawn by: TLR

checked by:

BCIN: **M2-1**





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SIGNATURE *EJF*  
NAME **ED FOWLER**  
BCIN **21019**

FEB 28/06 ISSUED FOR BUILDING PERMIT  
date revisions

customer  
**YWCA  
84 FREDERICK STREET  
KITCHENER, ONTARIO**

project  
**YWCA RENEWAL  
84 FREDERICK STREET  
KITCHENER, ONTARIO**

title  
**PROPOSED GROUND  
FLOOR PLAN  
PLUMBING LAYOUT**



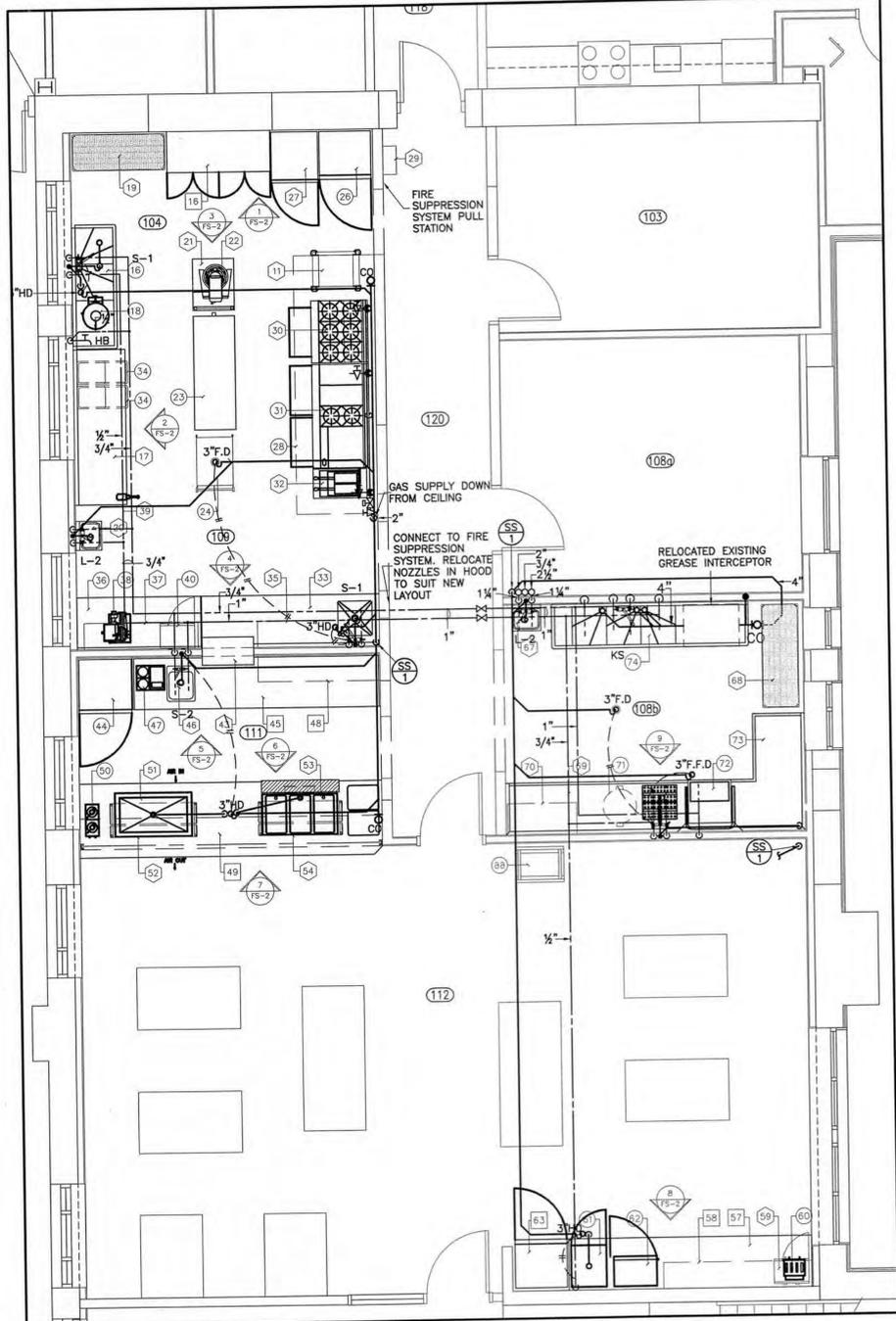
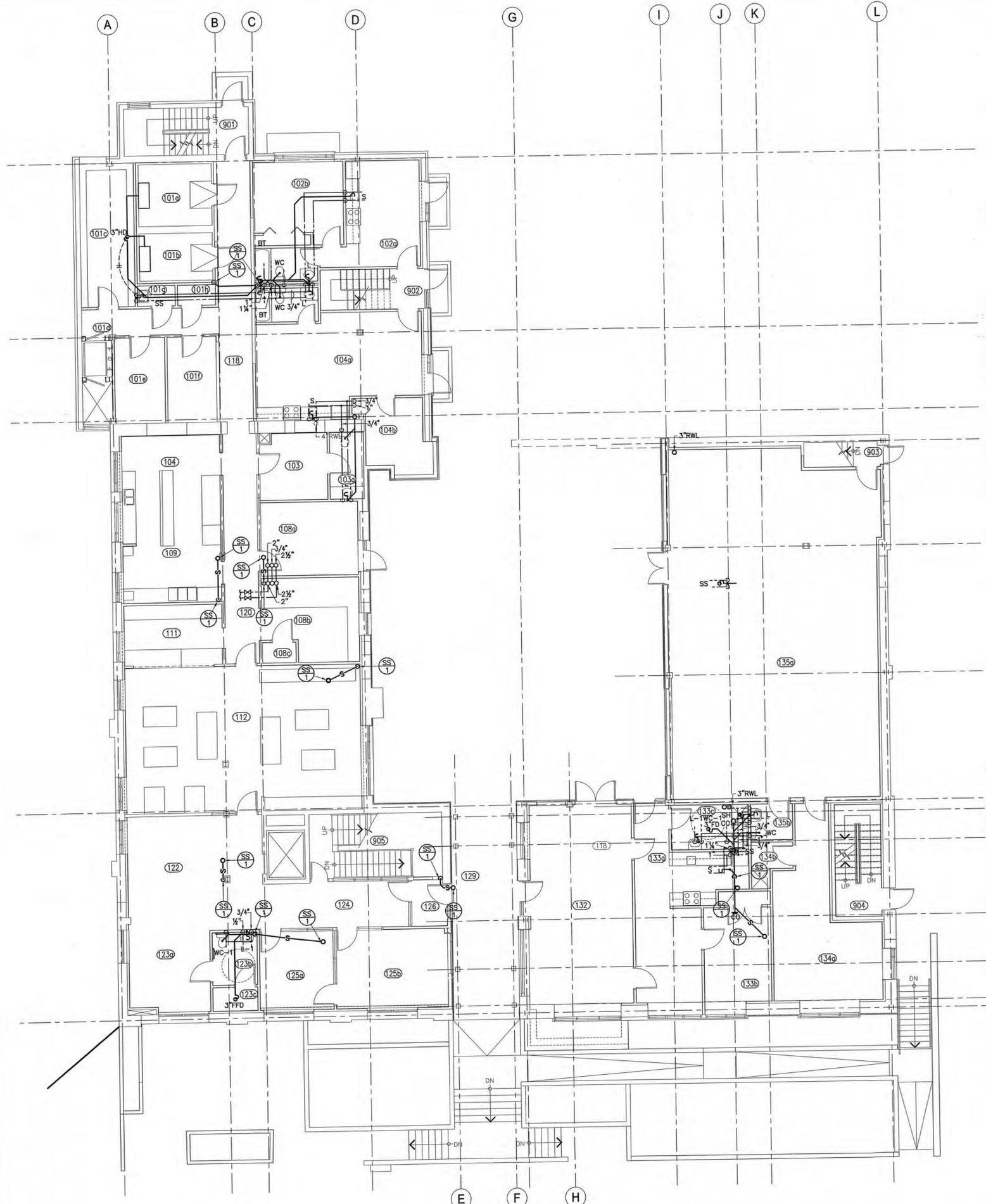
546 Belmont Ave. W., Kitchener, Ontario, N2M 5E3  
P. 519-576-2150 F. 519-576-5499 www.twfp.com

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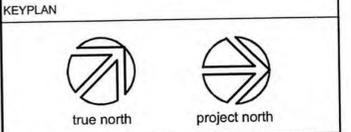
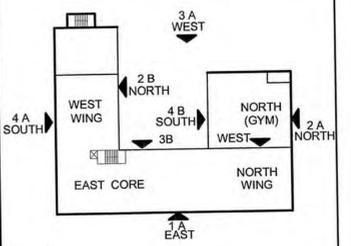
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date: FEB. 2005  
job no.: 2004-0433-10  
CAD file: M2-2\_2004043310  
drawn by: TLR  
checked by:

BCIN: sheet no.:  
**M2-2**



**1 KITCHEN PLUMBING LAYOUT**  
1/4"=1'-0"





I HAVE REVIEWED AND TAKEN RESPONSIBILITY FOR THE DESIGN WORK ON BEHALF OF THE WALTER FEDY PARTNERSHIP.

SIGNATURE *E. J. Fowler*

NAME E. J. Fowler

BCIN 21019

date	revisions
FEB 28/06	ISSUED FOR BUILDING PERMIT

customer

**YWCA**  
84 FREDERICK STREET  
KITCHENER, ONTARIO

project

**YWCA RENEWAL**  
84 FREDERICK STREET  
KITCHENER, ONTARIO

title

**THIRD FLOOR PLAN**  
**PLUMBING LAYOUT**

**THE walterfedy PARTNERSHIP**  
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scale: 1/8"=1'-0"

date: FEB. 2006

job no.: 2004-0433-10

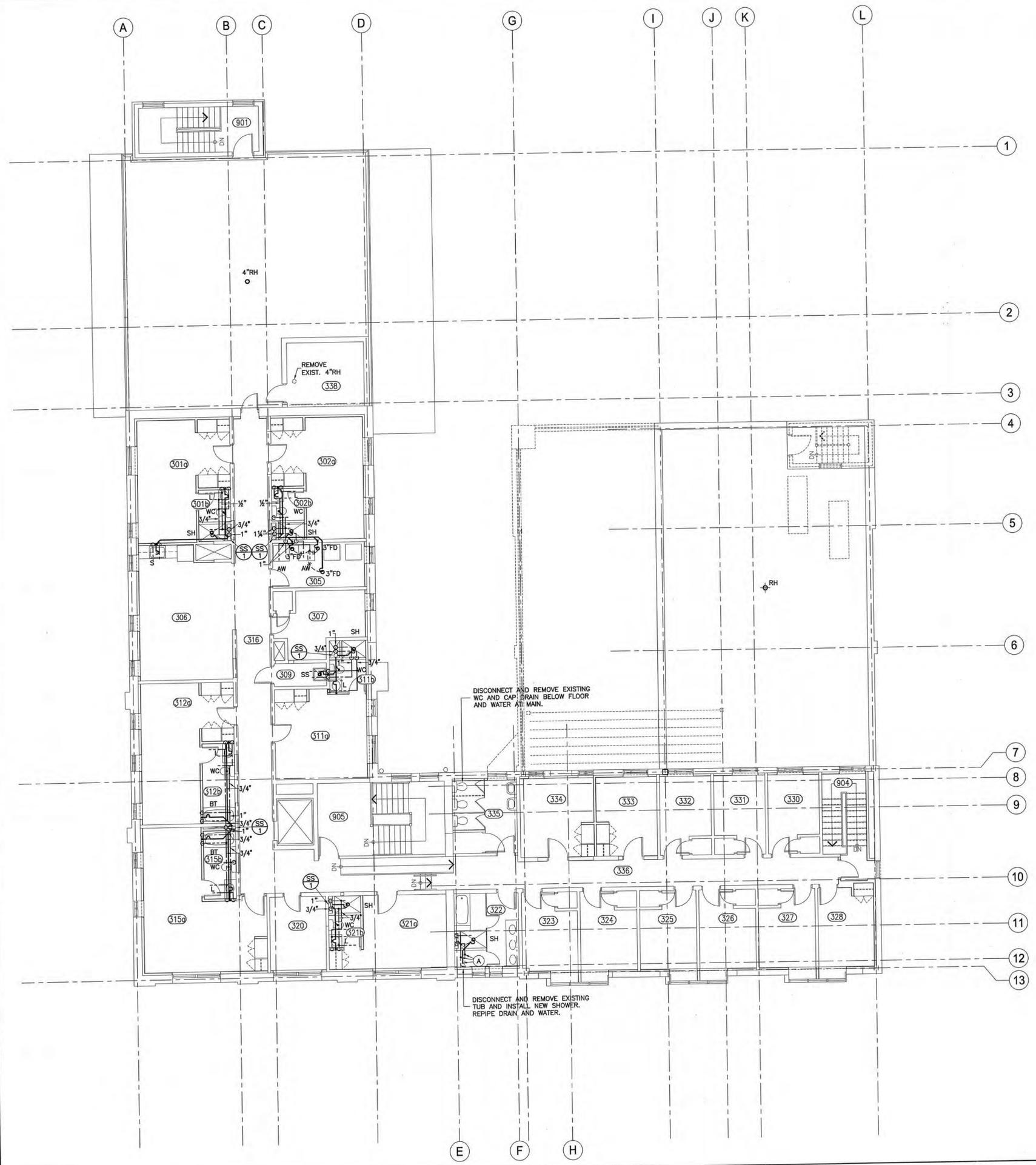
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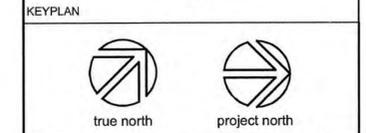
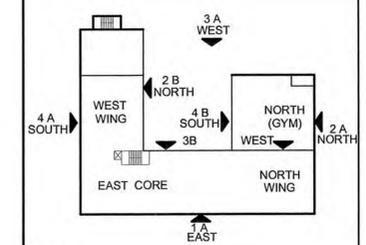
drawn by: TLR

checked by:

BCIN: 21019

sheet no.: **M2-4**





I HAVE REVIEWED AND TAKEN RESPONSIBILITY FOR THE DESIGN WORK ON BEHALF OF THE WALTER FEDY PARTNERSHIP.

SIGNATURE: *EJF*

NAME: **Ed Fowler**

BCIN: **21019**

FEB 28/06 ISSUED FOR BUILDING PERMIT

date	revisions

customer  
**YWCA**  
**84 FREDERICK STREET**  
**KITCHENER, ONTARIO**

project  
**YWCA RENEWAL**  
**845 FREDERICK STREET**  
**KITCHENER, ONTARIO**

title  
**BASEMENT FLOOR PLAN**  
**HVAC LAYOUT**



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job no.: 2004-0433-10

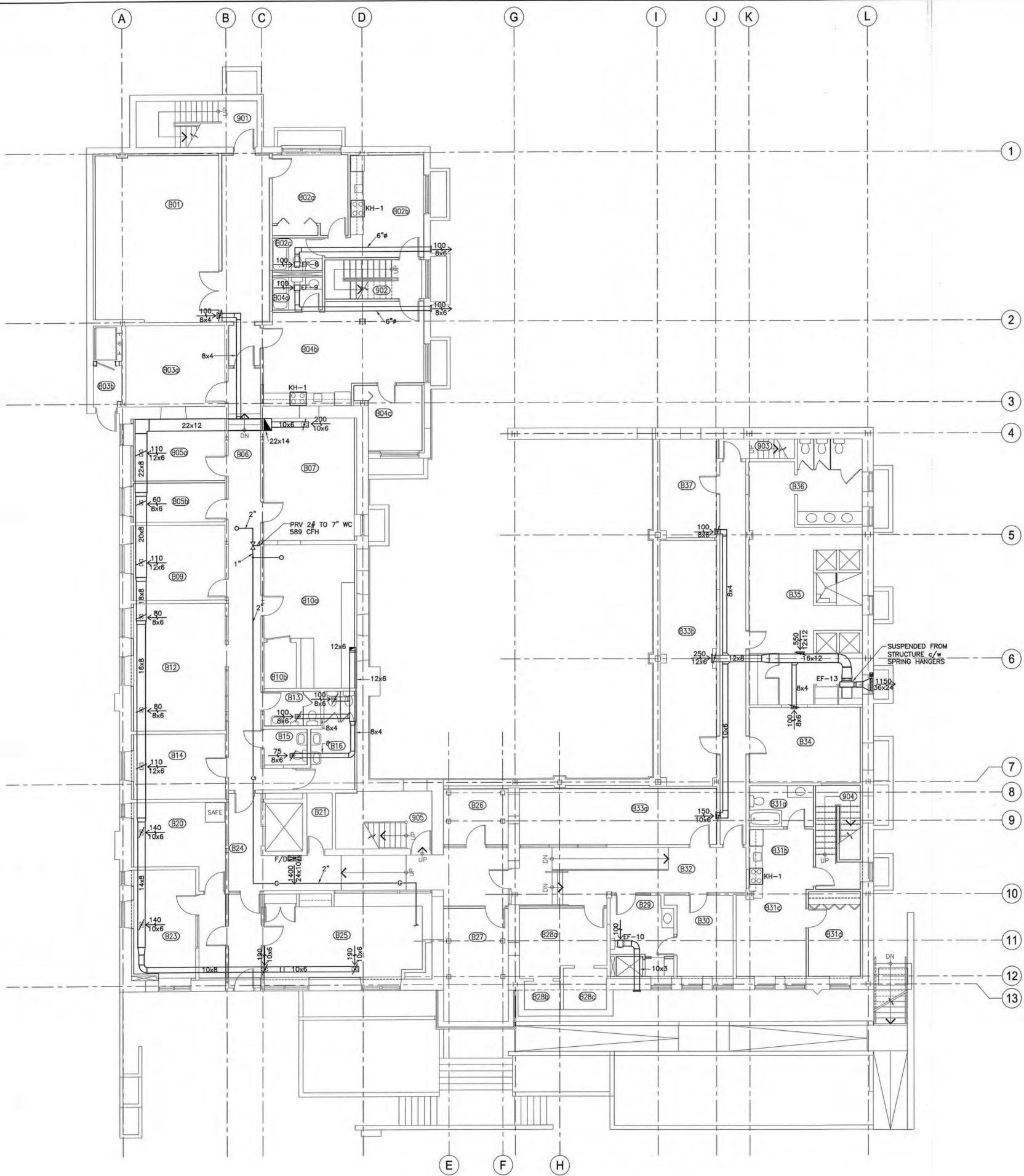
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drawn by: CR

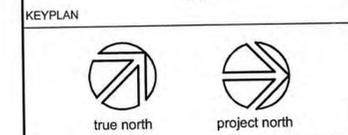
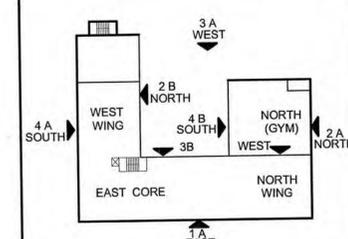
checked by:

BCIN: **M2-5**

sheet no.:







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 NAME: ED FOWLER  
 BCIN: 21019

FEB 28/06	ISSUED FOR BUILDING PERMIT
date	revisions
customer	
	YWCA 84 FREDERICK STREET KITCHENER, ONTARIO
project	YWCA RENEWAL 845 FREDERICK STREET KITCHENER, ONTARIO
title	SECOND FLOOR PLAN HVAC LAYOUT

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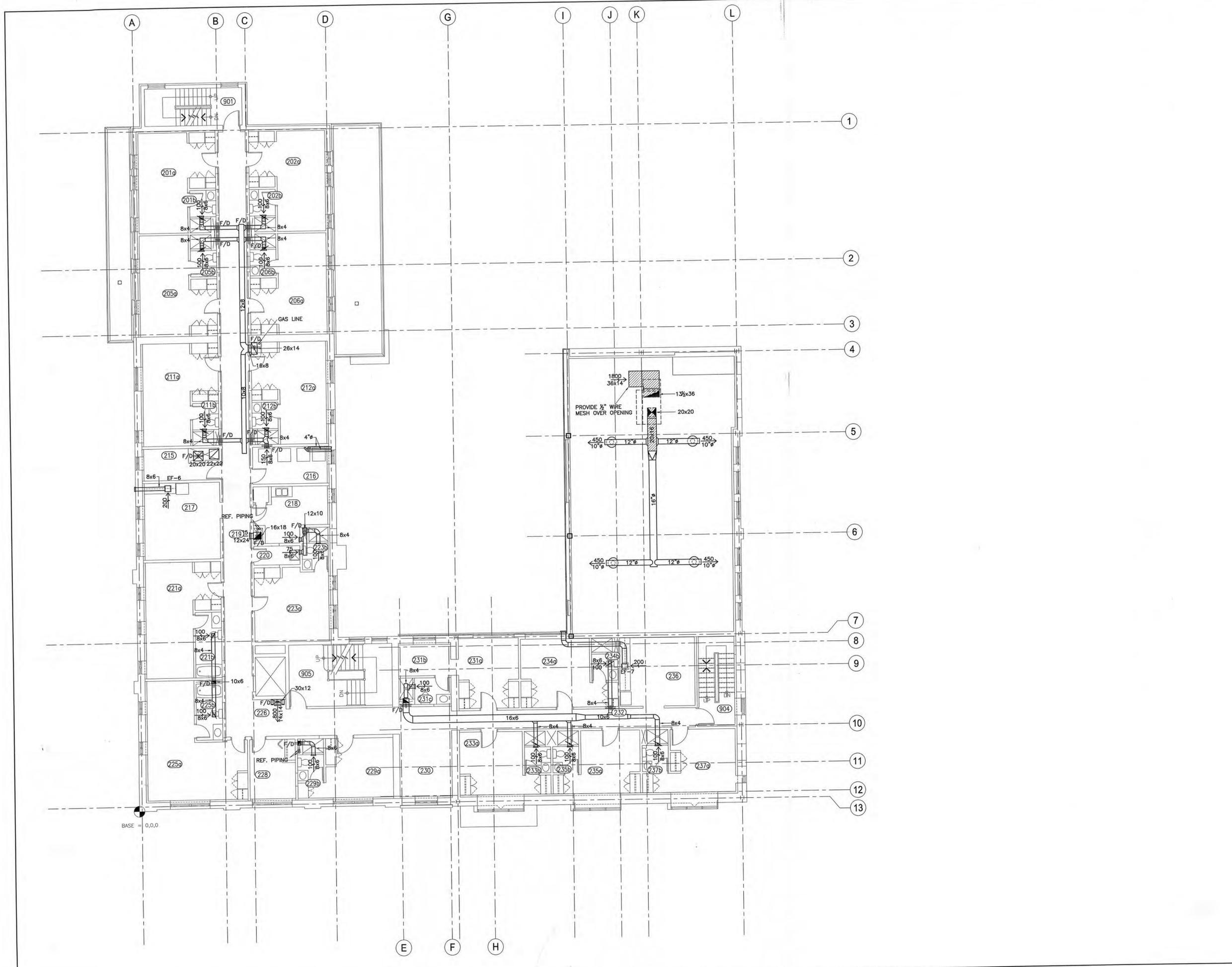
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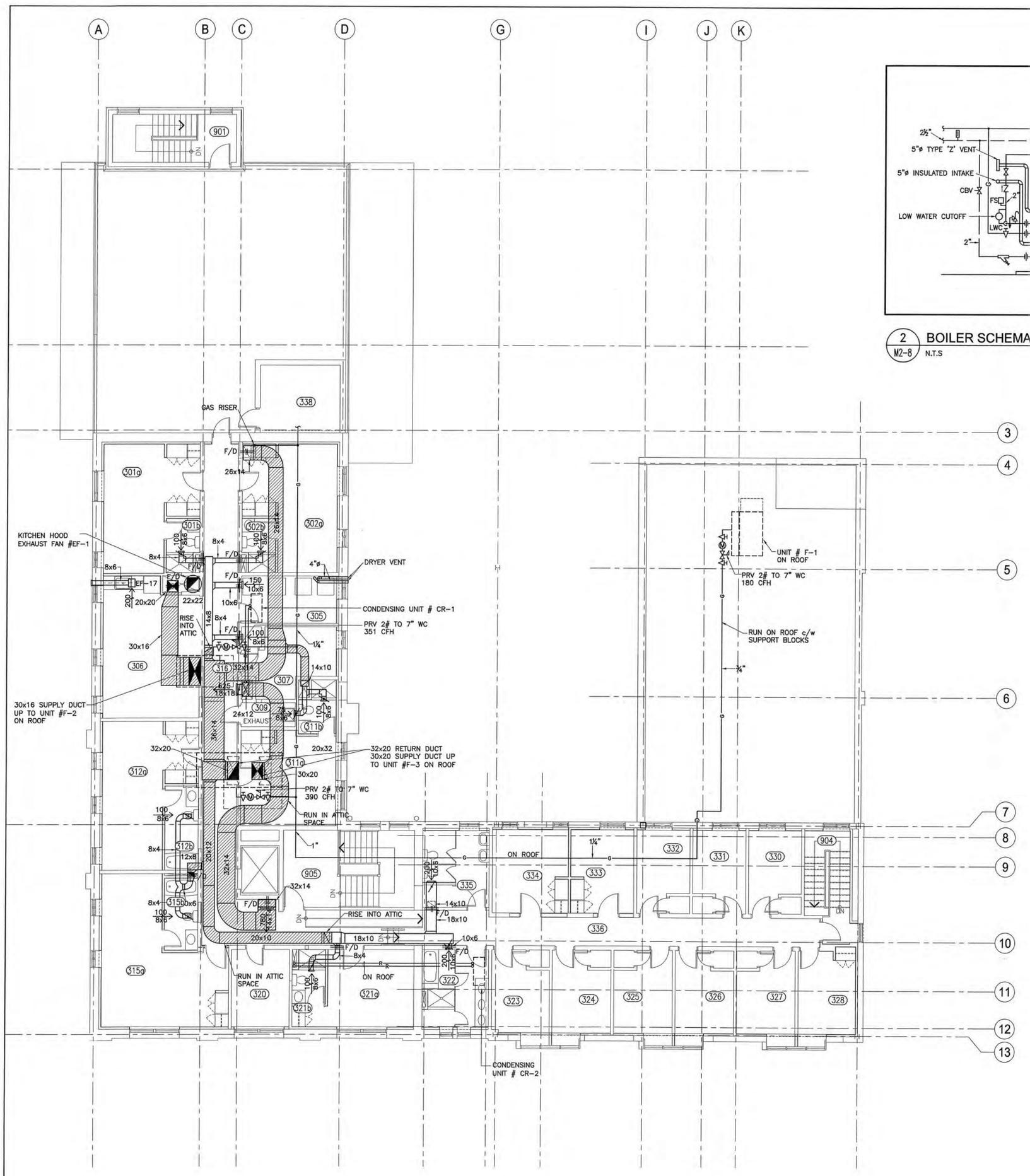
LICENSED PROFESSIONAL ENGINEER  
 E. J. FOWLER  
 PROVINCE OF ONTARIO

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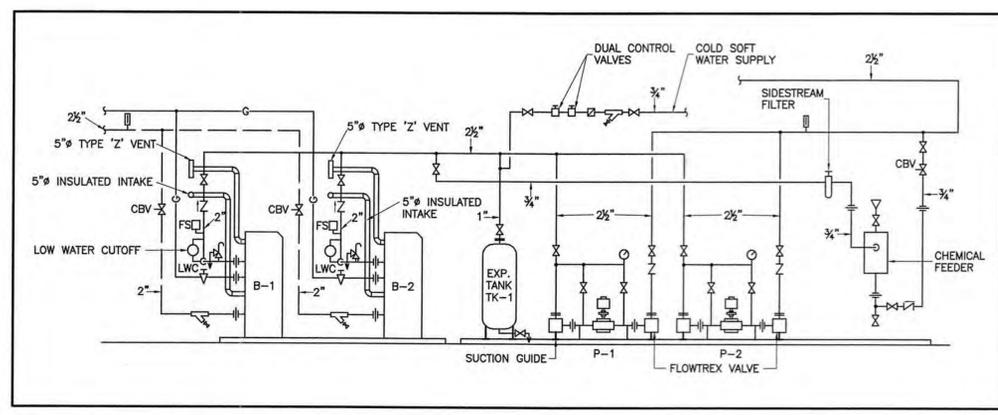
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 job no.: 2004-0433-10  
 CAD file: M2-3, 2004-0433-10  
 drawn by: CR  
 checked by:

BCIN: sheet no.: **M2-7**

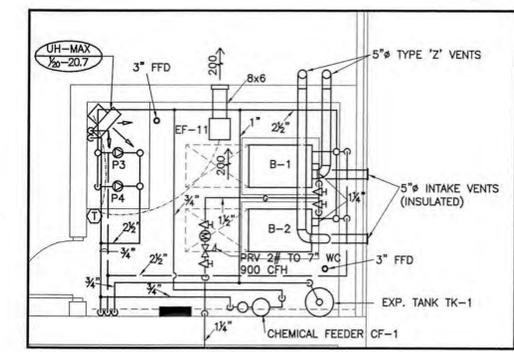




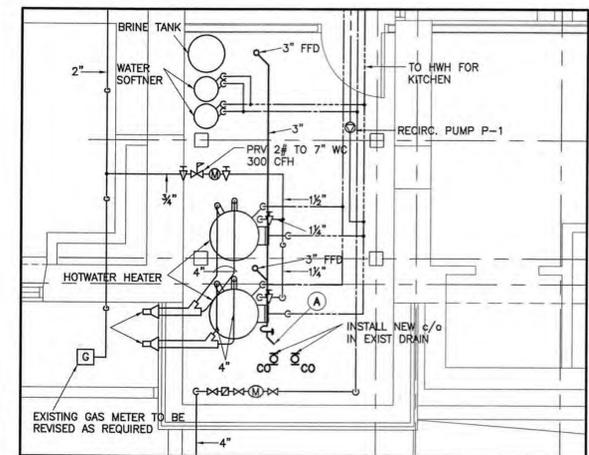
**1 THIRD FLOOR PLAN**  
M2-8 1/8" = 1'-0"



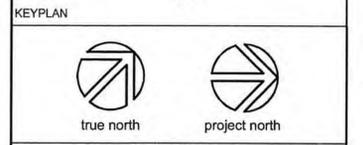
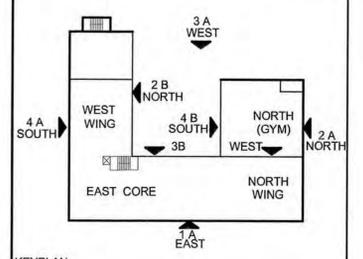
**2 BOILER SCHEMATIC**  
M2-8 N.T.S.



**3 BOILER ROOM LAYOUT**  
M2-8 1/4" = 1'-0"



**4 BASEMENT MECHANICAL ROOM LAYOUT**  
M2-8 1/4" = 1'-0"



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SIGNATURE: *E. J. Fowler*  
NAME: E. J. Fowler  
BCIN: 21619

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date: \_\_\_\_\_  
revisions: \_\_\_\_\_

customer:  
**YWCA**  
84 FREDERICK STREET  
KITCHENER, ONTARIO

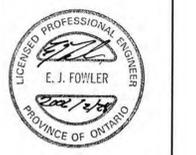
project:  
**YWCA RENEWAL**  
845 FREDERICK STREET  
KITCHENER, ONTARIO

title:  
**THIRD FLOOR PLAN**  
HVAC LAYOUT

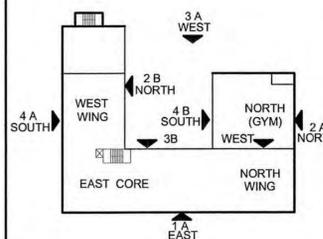


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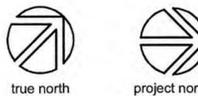
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drawn by: CR  
checked by: \_\_\_\_\_  
BCIN: \_\_\_\_\_  
sheet no.: **M2-8**



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SIGNATURE *EJ Fowler*  
NAME **ED FOWLER**  
BCIN **21019**

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date revisions

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**YWCA  
84 FREDERICK STREET  
KITCHENER, ONTARIO**

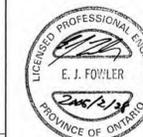
project  
**YWCA RENEWAL  
845 FREDERICK STREET  
KITCHENER, ONTARIO**

title  
**BASEMENT FLOOR PLAN  
RADIATION LAYOUT**

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ARCHITECTS • ENGINEERS

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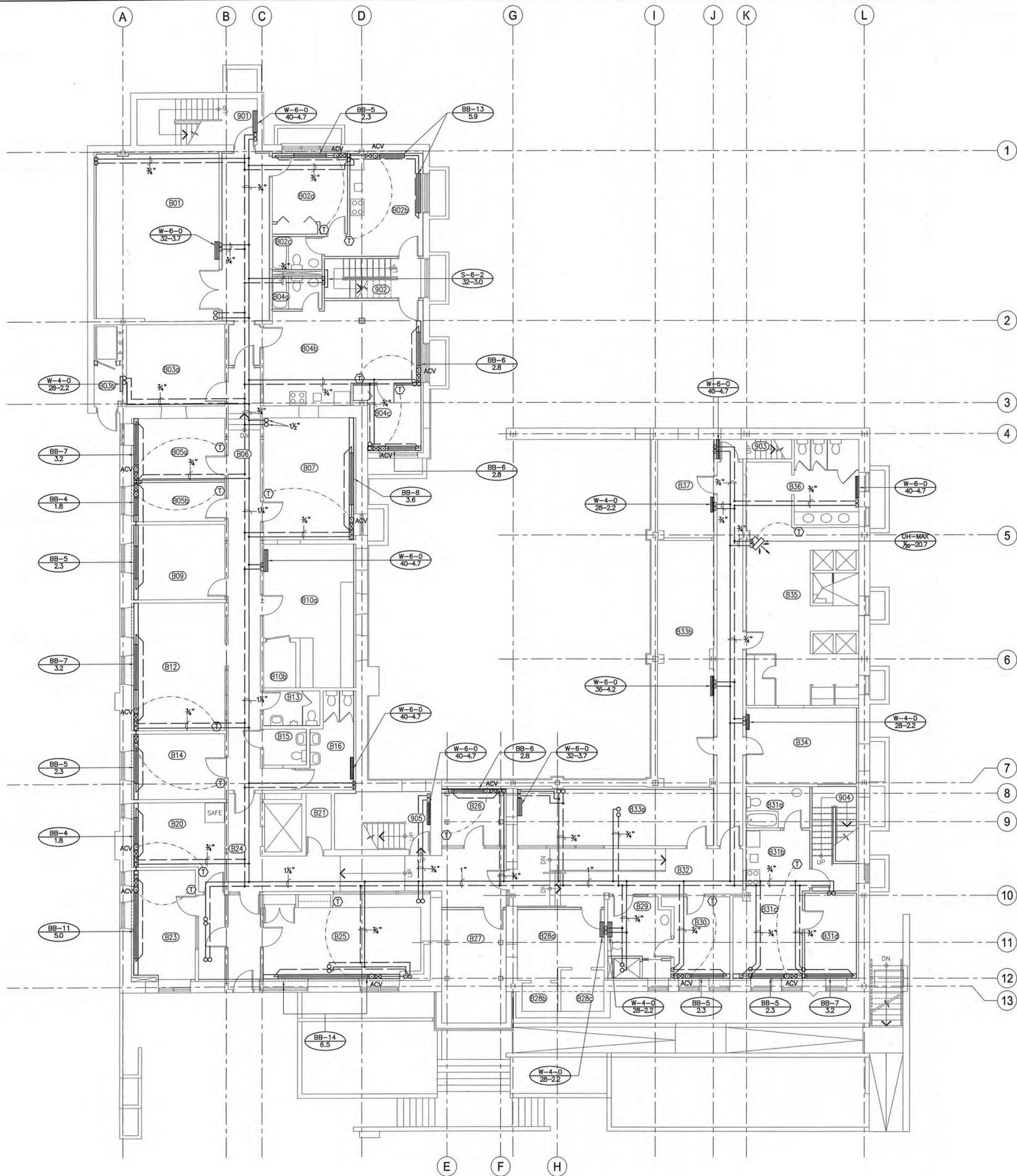
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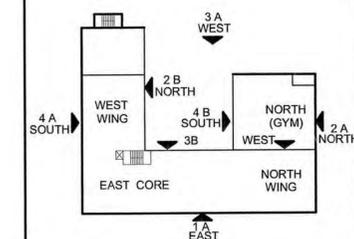
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drawn by: CR  
checked by:

BCIN:  
sheet no.:  
**M2-9**







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SIGNATURE *E. J. Fowler*  
 NAME **ED FOWLER**  
 BCIN **21019**

FEB 28/06 ISSUED FOR BUILDING PERMIT  
 date revisions

customer  
**YWCA**  
**84 FREDERICK STREET**  
**KITCHENER, ONTARIO**

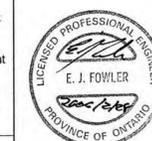
project  
**YWCA RENEWAL**  
**845 FREDERICK STREET**  
**KITCHENER, ONTARIO**

title  
**SECOND FLOOR PLAN**  
**RADIATION LAYOUT**



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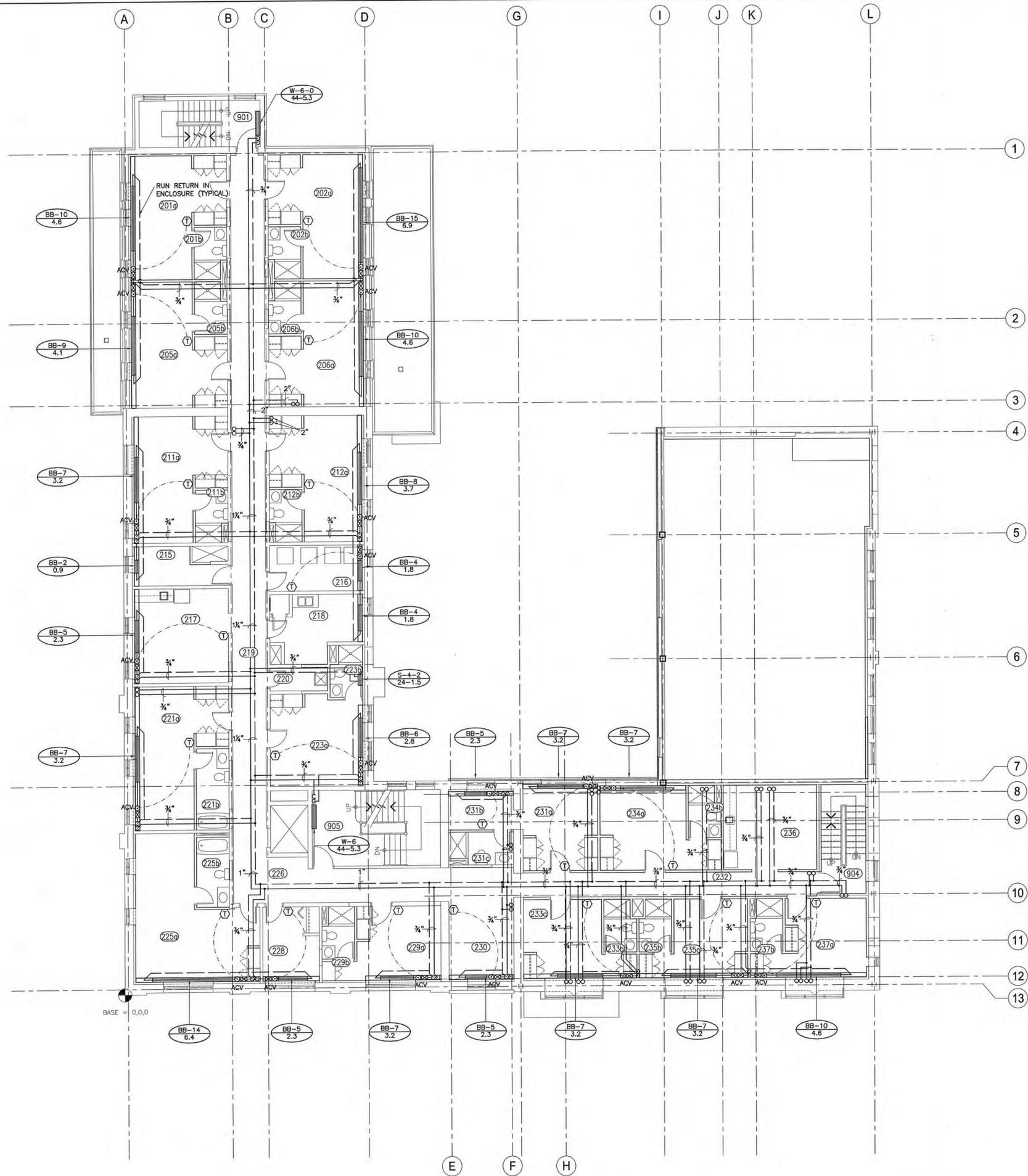


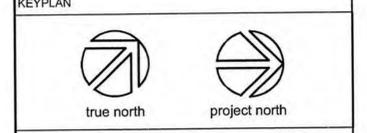
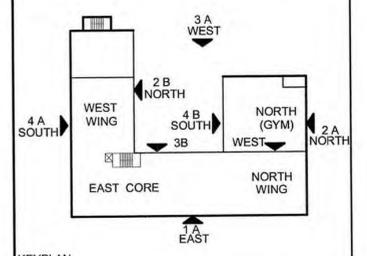
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 job no.: 2004-0433-10  
 CAD file: M2-3\_2004-0433-10  
 drawn by: CR  
 checked by:

BCIN:  
 sheet no.:

**M2-11**





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SIGNATURE *E. J. Fowler*  
 NAME **ED FOWLER**  
 BCIN **21019**

FEB 28/06	ISSUED FOR BUILDING PERMIT
date	revisions
customer	<b>YWCA 84 FREDERICK STREET KITCHENER, ONTARIO</b>
project	<b>YWCA RENEWAL 845 FREDERICK STREET KITCHENER, ONTARIO</b>
title	<b>THIRD FLOOR PLAN RADIATION LAYOUT</b>

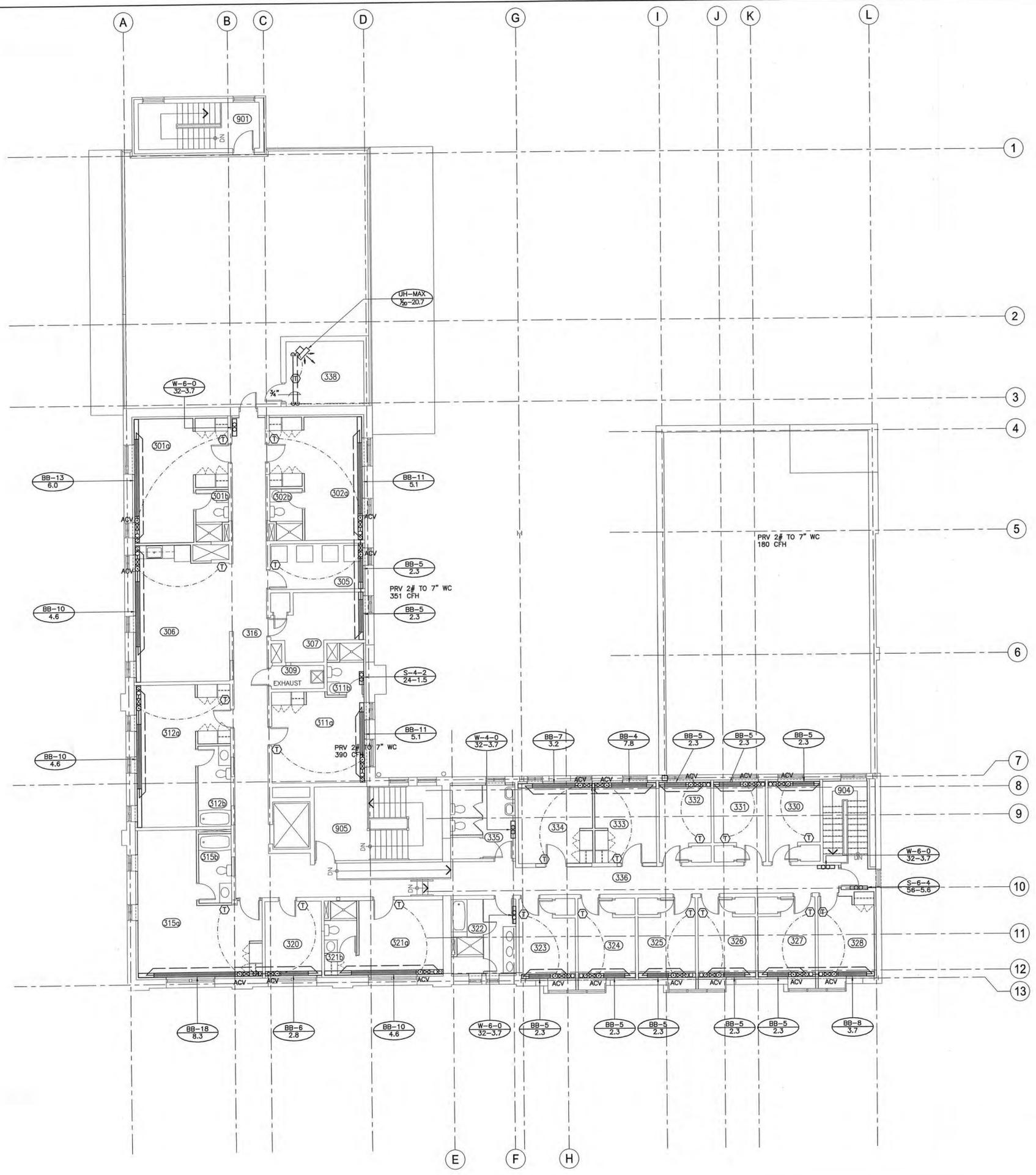
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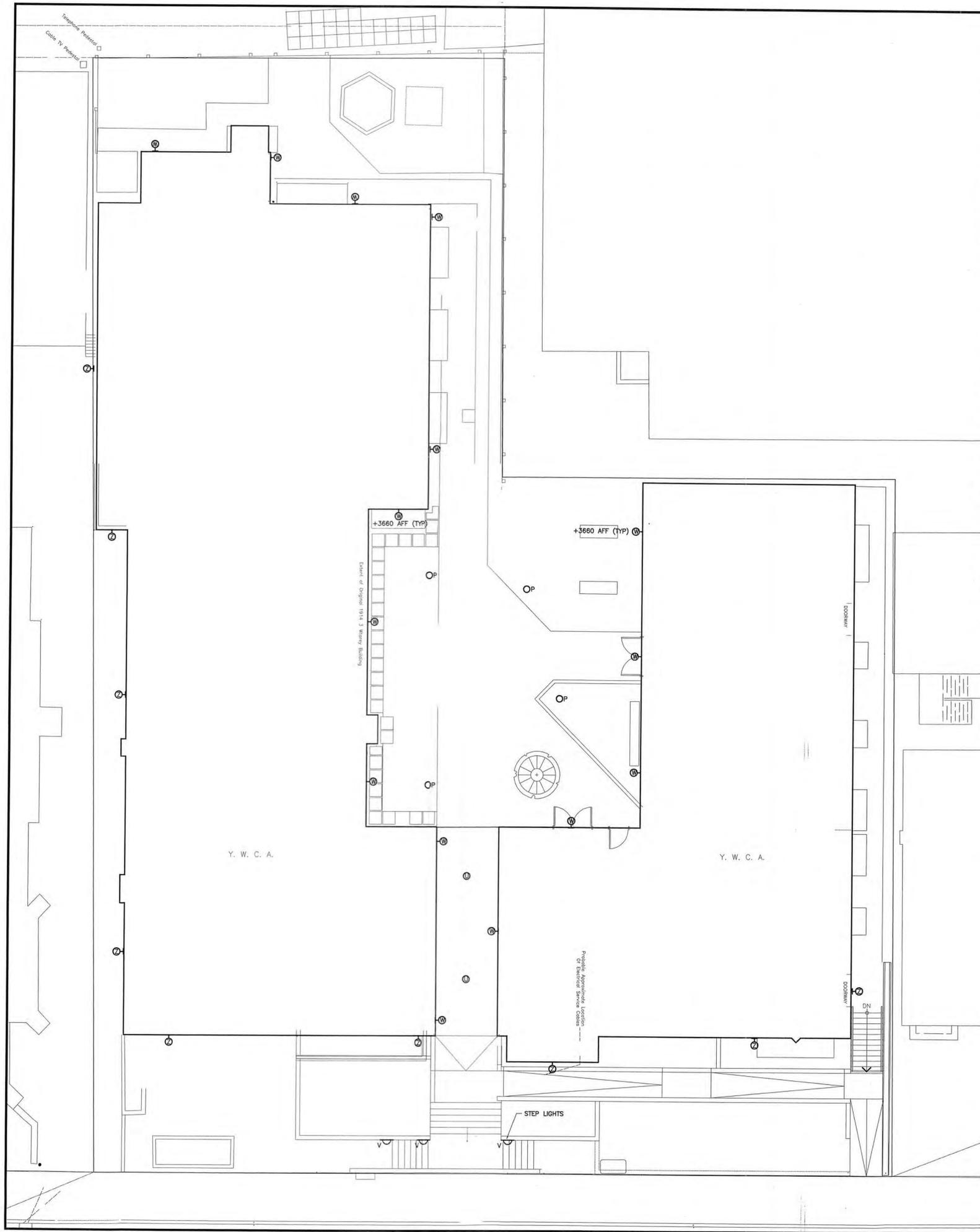
546 Belmont Ave. W., Kitchener, Ontario, N2M 5E3  
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 date: OCT 27/05  
 job no.: 2004-0433-10  
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 drawn by: CR  
 checked by:

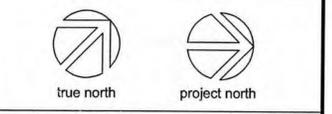
BCIN: **M2-12**





LIGHTING	
A	LIGHT FIXTURE (LETTER DENOTES TYPE)
□	FIXTURE ON UNSWITCHED CIRCUIT (E=EMERGENCY POWER, N/L=NIGHT LIGHT)
OB	LIGHT FIXTURE (LETTER DENOTES TYPE)
HC	WALL MOUNTED FIXTURE (LETTER DENOTES TYPE)
⊖	RECESSED STEP LIGHT
⊕	EXIT LIGHT CEILING MOUNTED (ARROW INDICATES DIRECTION OF EXIT)
⊕	EXIT LIGHT WALL MOUNTED (ARROW INDICATES DIRECTION OF EXIT)
⊕	EXIT LIGHT WALL MOUNTED C/W INTEGRAL EMERGENCY LIGHTING HEADS
⊕	EMERGENCY BATTERY UNIT PLUGGED INTO SINGLE RECEPTACLE
⊕	EMERGENCY BATTERY UNIT WITH INTEGRAL EMERGENCY LIGHTING HEADS
⊕	DOUBLE EMERGENCY LIGHTING HEADS
⊕	OCCUPANCY SENSOR - CEILING MOUNTED
PC	PHOTO CONTROL
⊕	SINGLE POLE SWITCH (3,4=3 OR 4 WAY, K=KEY OPERATED)
⊕	GANG MOUNTED SWITCHES
⊕	CIRCUIT LEG IDENTIFIER
POWER AND SYSTEMS	
⊕	DUPLEX RECEPTACLE
⊕	DUPLEX RECEPTACLE MOUNTED ABOVE COUNTER TOP OR AS NOTED
⊕	SPECIAL RECEPTACLE (TYPE AS NOTED)
⊕	SPECIAL RECEPTACLE MOUNTED ABOVE COUNTER TOP OR AS NOTED
⊕	DUPLEX RECEPTACLE (GFCI PROTECTED)
⊕	TELECOMMUNICATIONS OUTLET (BOX & CONDUIT ONLY)
⊕	TELECOMMUNICATIONS OUTLET MOUNTED ABOVE COUNTER (BOX & CONDUIT ONLY)
⊕	TELEVISION OUTLET
⊕	DIRECT CONNECTION
⊕	CONTACTOR
⊕	FLUSH MOUNT PANELBOARD
⊕	SURFACE MOUNT PANELBOARD
TC	TIME CLOCK
XX-XX	PANEL DESIGNATION (SMALL SIZE)
MH	MOUNTING HEIGHT
WP	WEATHER PROOF/WATER PROOF
CM	CEILING MOUNTED
HK	HOUSEKEEPING
RENOVATION	
EX	EXISTING DEVICE TO REMAIN AS PRESENTLY INSTALLED
DR	DISCONNECT AND REMOVE EXISTING DEVICE COMPLETELY
REL	DISCONNECT AND REMOVE EXISTING DEVICE FOR RELOCATION
REL	EXISTING DEVICE IN RELOCATED POSITION AND RECONNECTED AS PREVIOUS UNLESS NOTED OTHERWISE

FIRE ALARM	
⊕	FIRE ALARM PANEL (FACP=CONTROL PANEL, FAAP=ANNUNCIATION PANEL)
⊕	HEAT DETECTOR 57°C (135°F) FIXED AND RATE OF RISE (UNLESS NOTED OTHERWISE)
⊕	MANUAL PULL STATION (NC = NORMALLY CLOSED AUXILIARY CONTACTS)
⊕	SMOKE DETECTOR - IONIZATION TYPE (R=RELAY BASE)
⊕	FIRE ALARM HORN (S = STROBE)
⊕	END OF LINE DEVICE
MECHANICAL	
⊕	MOTOR
⊕	UNFUSED DISCONNECT SWITCH
⊕	FUSED DISCONNECT SWITCH
⊕	MANUAL STARTER
⊕	CEILING FAN
⊕	MECHANICAL EQUIPMENT REFERENCE SYMBOL
⊕	RELAY
SECURITY	
⊕	CCTV CAMERA
⊕	MAGNETIC LOCK



I HAVE REVIEWED AND TAKEN RESPONSIBILITY FOR THE DESIGN WORK ON BEHALF OF THE WALTER FEDY PARTNERSHIP.

SIGNATURE: *David Buck*

NAME: DAVID BUCK

BCIN: 21610

FEB 28/06 ISSUED FOR BUILDING PERMIT

customer: YWCA RENEWAL KITCHENER, ONTARIO

project: YWCA RENEWAL KITCHENER, ONTARIO

title: ELECTRICAL SITE PLAN & LEGENDS

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ARCHITECTS • ENGINEERS

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PROFESSIONAL ENGINEER  
REGISTERED  
D. C. BUCK  
PROVINCE OF ONTARIO

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scale: 1:100

date: FEB 02/06

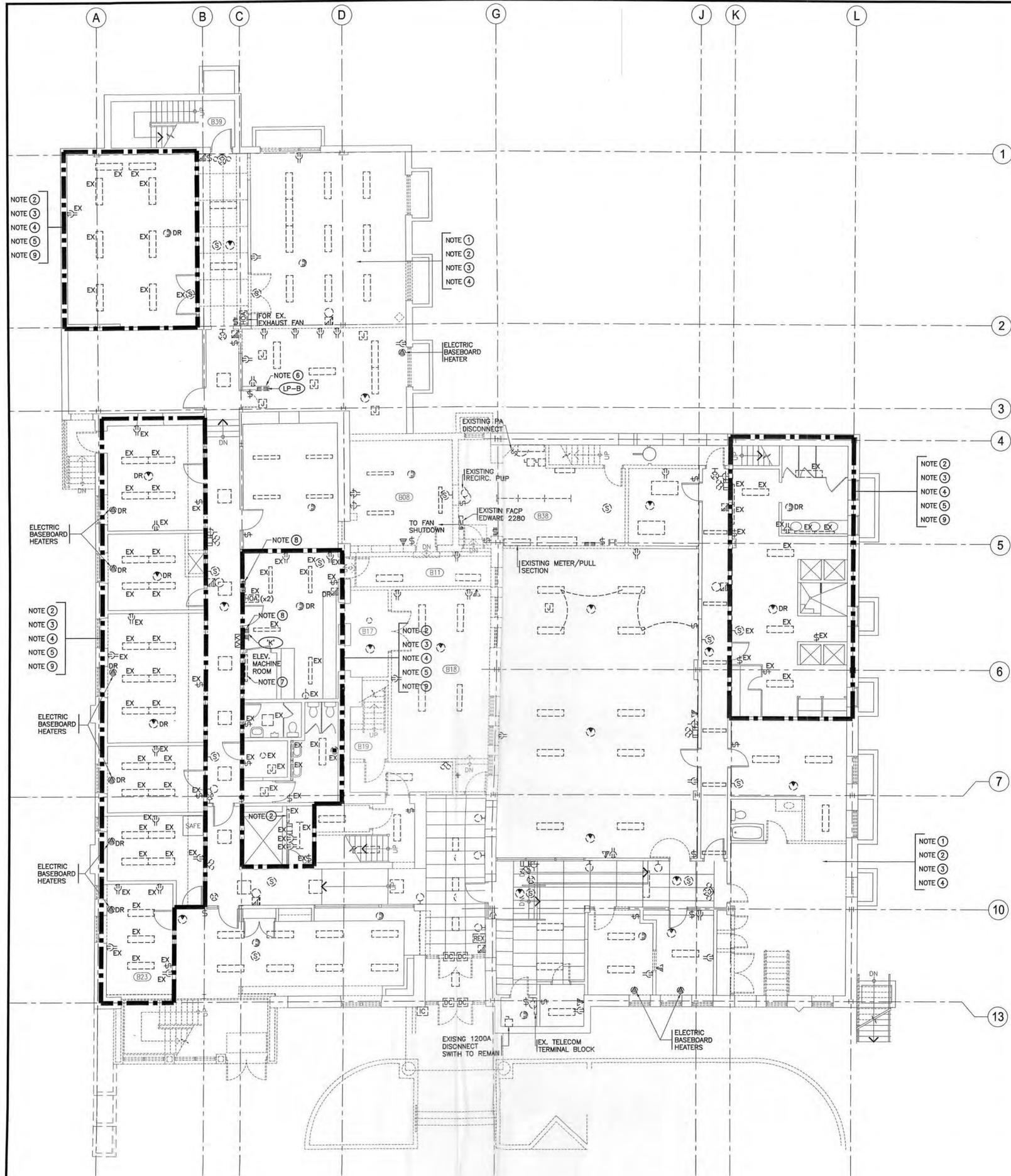
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CAD file: E1-1\_2004-0433-10

drawn by: EP

checked by:

BCIN: sheet no.: **E1-1**

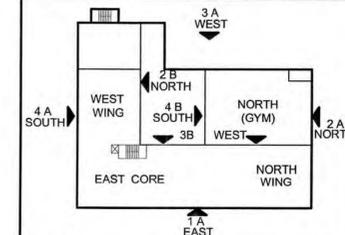


**GENERAL NOTES:**

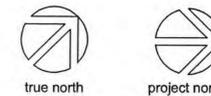
1. ALL SYSTEMS TO REMAIN IN SERVICE DURING CONSTRUCTION.
2. ELECTRICAL CONTRACTOR TO COORDINATE WITH OTHER TRADES FOR DISCONNECTS AND REMOVAL OF ELECTRICAL DEVICES THROUGH DIFFERENT PHASES.
3. ELECTRICAL CONTRACTOR TO PROVIDE TEMPORARY EXIT SIGNS OTHER SIGNAGE AS REQUIRED TO MAINTAIN EMERGENCY PATHS DURING CONSTRUCTION PHASES.
4. EXISTING ELECTRICAL ROOM TO BE DEMOLISHED. ALL ELECTRICAL EQUIPMENT/DEVICES TO BE REMOVED OR RELOCATED. REFER TO NEW ELECTRICAL ROOM LAYOUT FOR MORE INFORMATION.
5. EXISTING FIRE ALARM SYSTEM TO BE REPLACED WITH NEW, NEW FACP TO BE LOCATED IN NEW ELECTRICAL ROOM. FIRE ALARM SYSTEM TO REMAIN IN SERVICE DURING ALL PHASES OF CONSTRUCTION.

**DEMOLITION NOTES:**

- ① DISCONNECT AND REMOVE ALL EXISTING LIGHTING FIXTURES IN THIS AREA.
- ② DISCONNECT AND REMOVE ALL ELECTRIC HEATERS IN THIS AREA.
- ③ DISCONNECT AND REMOVE FIRE ALARM DEVICES IN ACCORDANCE WITH CONSTRUCTION PHASING. REFER TO NEW FLOOR PLANS FOR NEW FIRE ALARM SYSTEM LAYOUT.
- ④ FIRE ALARM AND SECURITY SYSTEMS TO BE OPERATIONAL THROUGHOUT THE REST OF THE BUILDING.
- ⑤ LIGHTING FIXTURES AND ELECTRICAL DEVICES TO REMAIN.
- ⑥ EXISTING PANEL TO BE REMOVED. REMAINING LOADS TO BE TRANSFERRED TO NEW PANELS. REFER TO POWER PLANS AND PANEL SCHEDULES FOR MORE INFORMATION.
- ⑦ EXISTING SPLITTER "SP-1" FOR ELEVATOR MACHINE(S) TO REMAIN. ELEVATOR SERVICE TO BE MAINTAINED DURING ALL PHASES OF CONSTRUCTION.
- ⑧ EXISTING PANEL TO BE REPLACED. REFER TO POWER PLANS FOR MORE INFORMATION.



KEYPLAN



I HAVE REVIEWED AND TAKEN RESPONSIBILITY FOR THE DESIGN WORK ON BEHALF OF THE WALTER FEDY PARTNERSHIP.

SIGNATURE *David Buck*  
 NAME DAVID BUCK  
 BCIN 21610

FEB 28/06 ISSUED FOR BUILDING PERMIT  
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customer  
 YWCA RENEWAL  
 84 FREDERICK STREET  
 KITCHENER, ONTARIO

project  
 title  
 BASEMENT PLAN  
 ELECTRICAL DEMOLITION

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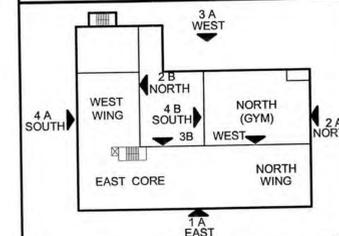


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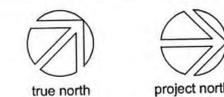
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 CAD file: ED-1\_2004-0433-10  
 drawn by: JP  
 checked by:

BCIN:  
 sheet no.:

**ED-1**



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SIGNATURE *David Buck*  
 NAME DAVID BUCK  
 BCIN 21610

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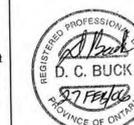
customer  
 YWCA RENEWAL  
 84 FREDERICK STREET  
 KITCHENER, ONTARIO

project  
 title  
 GROUND FLOOR PLAN  
 ELECTRICAL DEMOLITION

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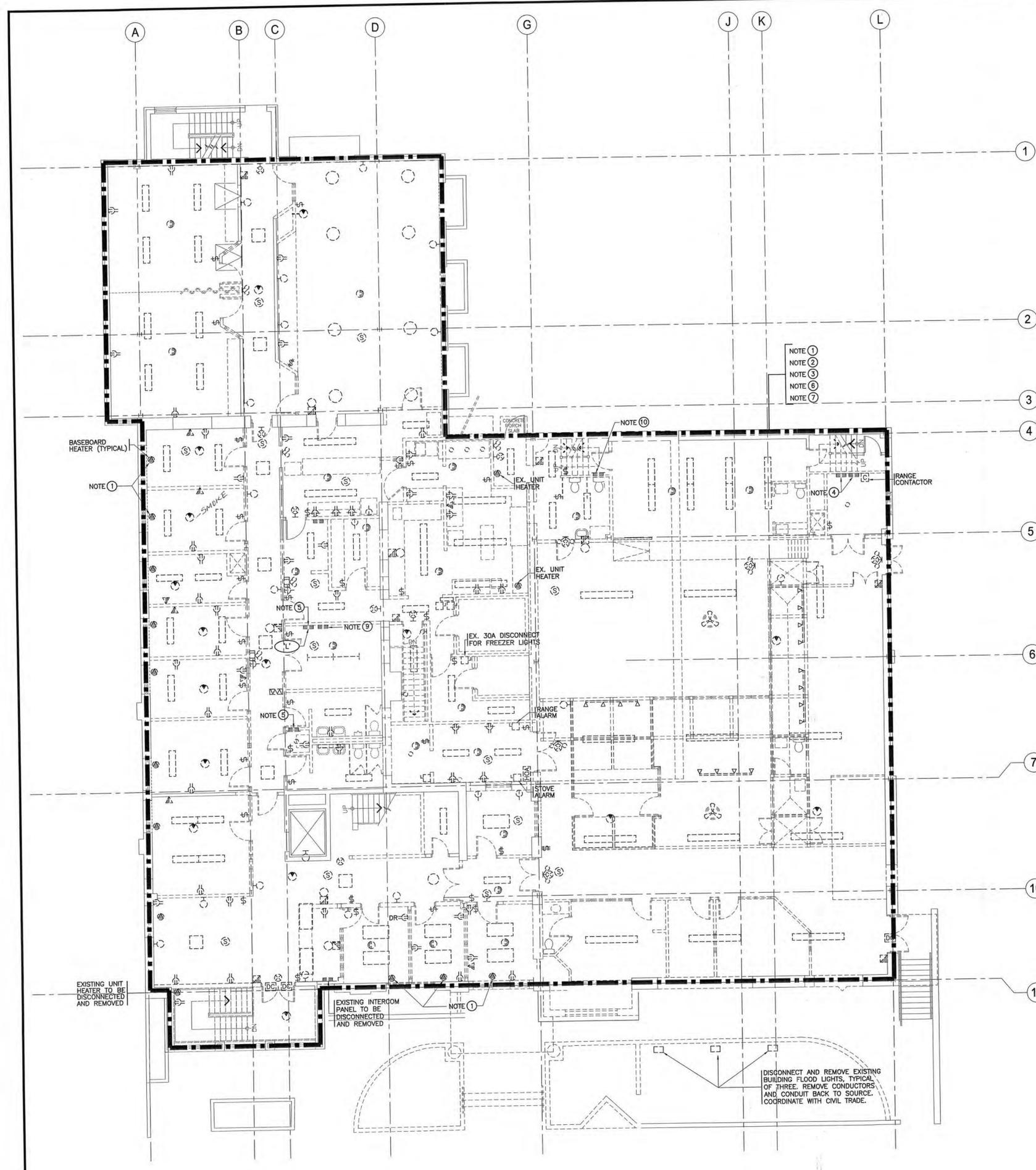
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 job no.: 2004-0433-10  
 CAD file: ED-2\_2004-0433-10  
 drawn by: JP  
 checked by:

BCIN:  
 sheet no:  
**ED-2**

- DEMOLITION NOTES:
- ① DISCONNECT AND REMOVE ALL EXISTING ELECTRICAL BASEBOARD HEATERS AND WIRING BACK TO POINT OF ORIGIN.
  - ② DISCONNECT AND REMOVE ALL LIGHTING FIXTURES.
  - ③ DISCONNECT AND REMOVE ALL ELECTRICAL DEVICES, WIRING, ETC BACK TO POINT OF SOURCE UNLESS OTHERWISE NOTED ON PLANS.
  - ④ EXISTING PANELS TO BE RELOCATED.
  - ⑤ EXISTING PANEL TO BE REPLACED. REFER TO POWER PLAN AND SINGLE LINE DIAGRAM FOR MORE DETAILS.
  - ⑥ CONTACT OWNER FOR DIRECTIONS ON KITCHEN EQUIPMENT.
  - ⑦ DISCONNECT AND REMOVE FIRE ALARM DEVICES. COORDINATE PHASING WITH OTHER TRADES. FIRE ALARM SYSTEM TO REMAIN IN SERVICE FOR THE REST OF THE BUILDING.
  - ⑧ PROVIDE TEMPORARY EXIT SIGNS AND OTHER REQUIRED SIGNAGE TO MAINTAIN ADEQUATE EMERGENCY EXIT PATHS THROUGHOUT CONSTRUCTION.
  - ⑨ EXISTING SECURITY PANEL, EXISTING SECURITY SYSTEM TO BE REPLACED. ELECTRICAL TO COORDINATE PHASING WITH OTHER TRADES. SECURITY SYSTEM TO REMAIN IN SERVICE DURING CONSTRUCTION.
  - ⑩ DISCONNECT AND REMOVE EXISTING PANEL.



NOTE ①  
 NOTE ②  
 NOTE ③  
 NOTE ⑥  
 NOTE ⑦

NOTE ⑩

DISCONNECT AND REMOVE EXISTING BUILDING FLOOD LIGHTS, TYPICAL OF THREE. REMOVE CONDUCTORS AND CONDUIT BACK TO SOURCE. COORDINATE WITH CIVIL TRADE.

BASEBOARD HEATER (TYPICAL)

NOTE ①

NOTE ⑤

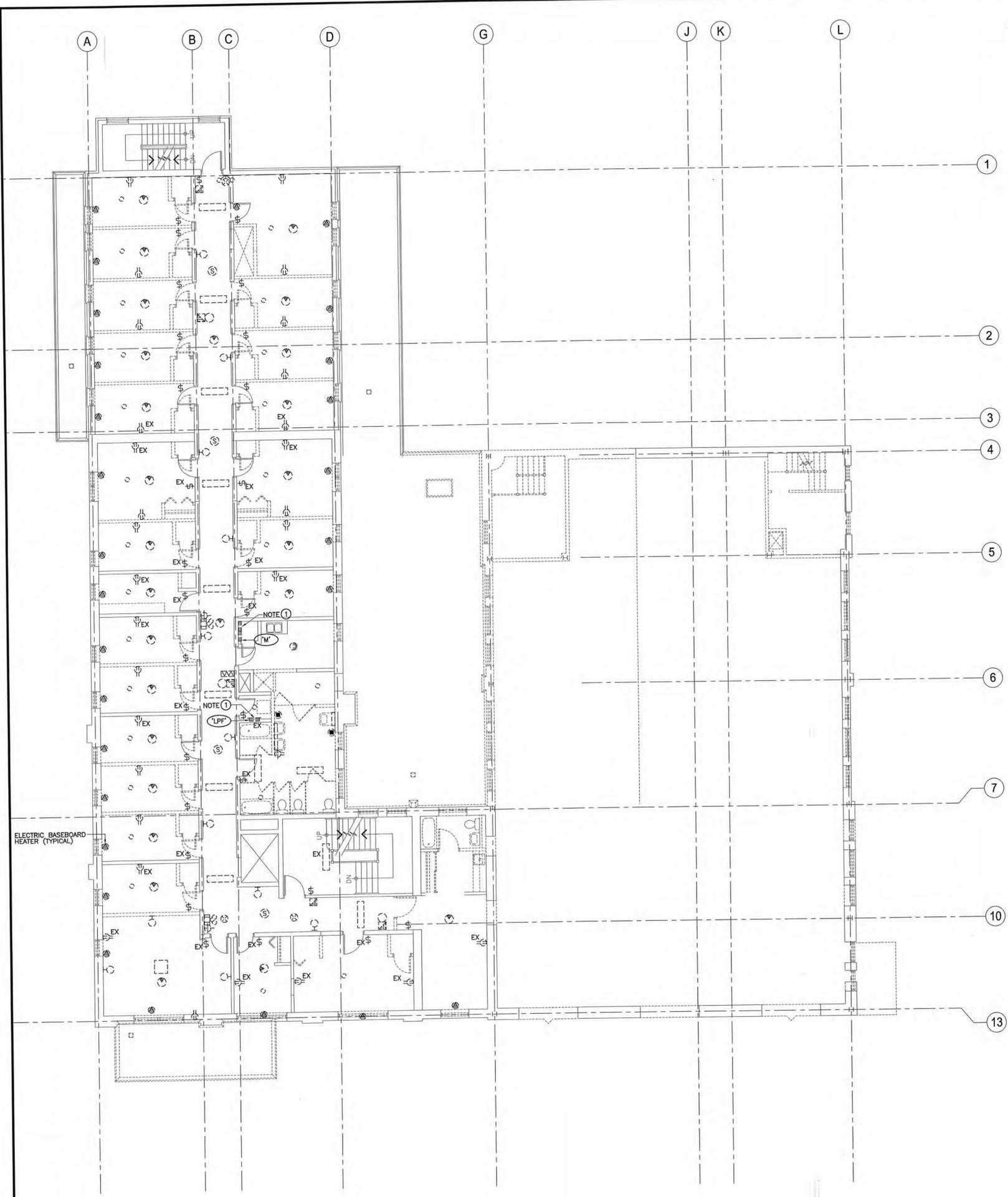
NOTE ⑨

NOTE ⑤

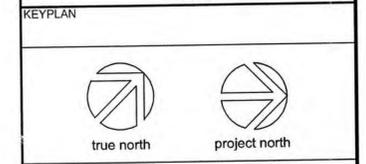
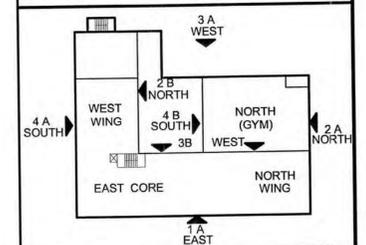
EXISTING INTERCOM PANEL TO BE DISCONNECTED AND REMOVED

EXISTING UNIT HEATER TO BE DISCONNECTED AND REMOVED

DISCONNECT AND REMOVE EXISTING BUILDING FLOOD LIGHTS, TYPICAL OF THREE. REMOVE CONDUCTORS AND CONDUIT BACK TO SOURCE. COORDINATE WITH CIVIL TRADE.



- GENERAL NOTES:**
- EXISTING PANEL TO REMAIN AND RENMME. REFER TO POWER PLANS FOR MORE DETAILS.
- DEMOLITION NOTES:**
- DISCONNECT AND REMOVE ALL EXISTING ELECTRICAL BASEBOARD HEATERS AND WIRING BACK TO POINT OF ORIGIN.
  - DISCONNECT AND REMOVE ALL EXISTING LIGHTING FIXTURES.
  - DISCONNECT AND REMOVE ALL EXISTING FIRE ALARM DEVICES. REPLACE WITH NEW AS SHOWN ON NEW FLOOR PLANS. COORDINATE WITH OTHER TRADES FOR PHASING. FIRE ALARM SYSTEM TO REMAIN IN SERVICE FOR ALL OTHER AREAS OF THE BUILDING DURING CONSTRUCTION.
  - EXISTING ELECTRICAL DEVICES LOCATED ON WALLS THAT ARE NOT PART OF THE DEMOLITION TO REMAIN (NOTED "EX" ON PLANS).



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 NAME **DAVID BUCK**  
 BCIN **21610**

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customer  
**YWCA RENEWAL  
 84 FREDERICK STREET  
 KITCHENER, ONTARIO**

project

title  
**SECOND FLOOR PLAN  
 ELECTRICAL DEMOLITION**

**THE Walterfedy PARTNERSHIP**  
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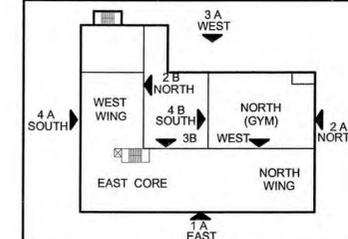
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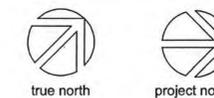
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KEYPLAN



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customer  
**YWCA RENEWAL**  
**84 FREDERICK STREET**  
**KITCHENER, ONTARIO**

project  
 title  
**THIRD FLOOR PLAN**  
**ELECTRICAL DEMOLITION**

**THE walterfedy PARTNERSHIP**  
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BCIN:

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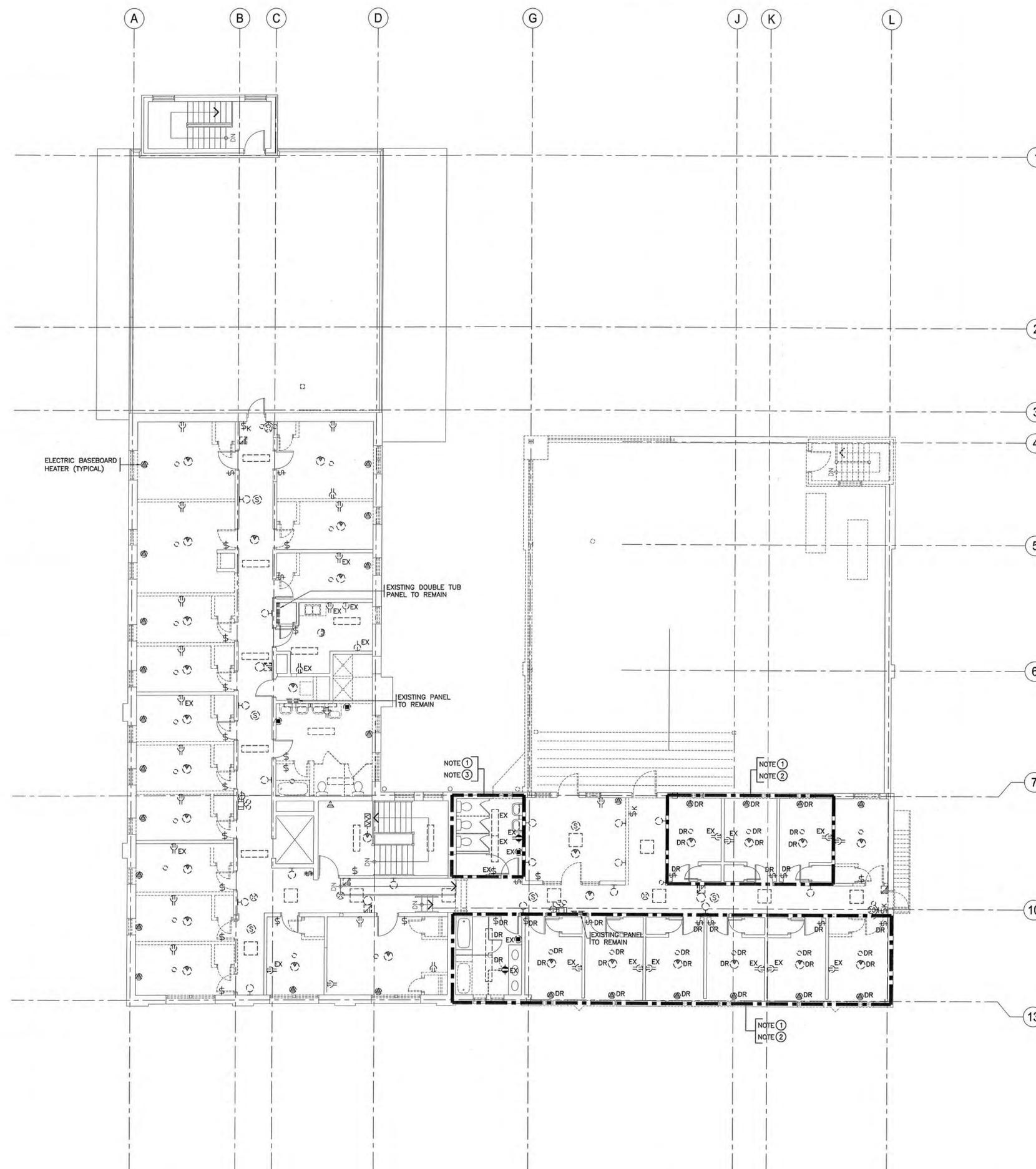
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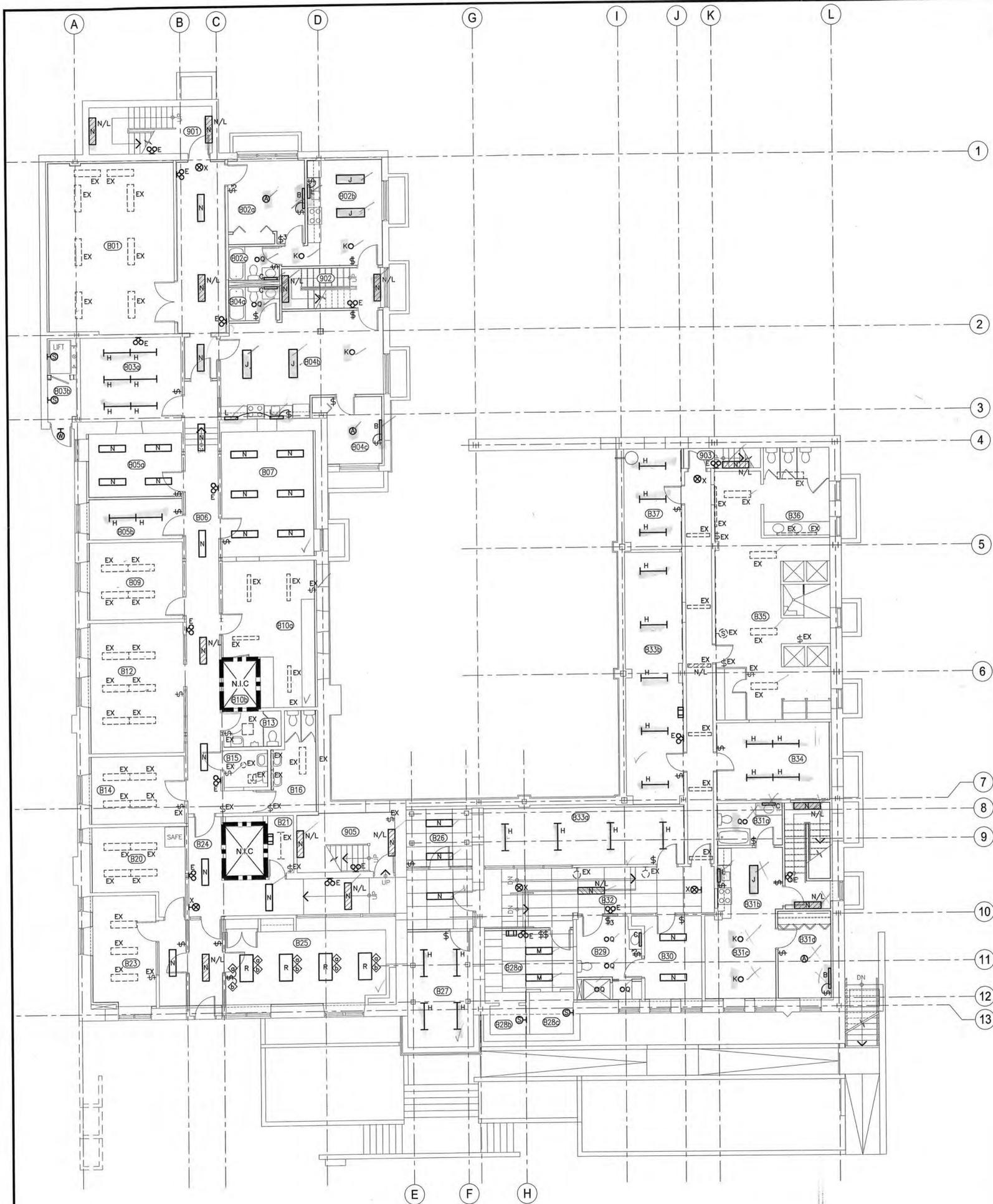
**GENERAL NOTES:**

1. DISCONNECT AND REMOVE ALL EXISTING ELECTRICAL BASEBOARD HEATERS AND WIRING BACK TO SOURCE.
2. REMOVE ALL FIRE ALARM DEVICES. COORDINATE WITH OTHER TRADES FOR PHASING. FIRE ALARM SYSTEM TO REMAIN IN SERVICE DURING THE CONSTRUCTION PROCESS.
3. REMOVE ALL LIGHTING FIXTURES. RETAIN EXISTING WIRING AND OUTLET BOXES FOR NEW LIGHTING FIXTURES.
4. ALL ELECTRICAL DEVICES MOUNTED ON WALLS THAT WILL REMAIN ARE EXISTING TO REMAIN (LABELED "EX" ON PLAN).

**DEMOLITION NOTES:**

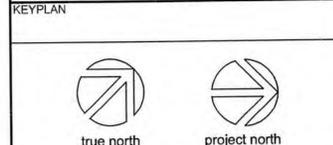
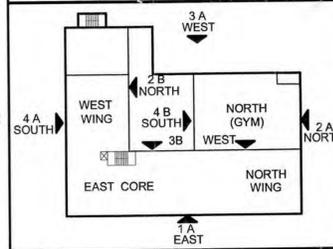
- 1 ALL RECEPTACLES ARE EXISTING TO REMAIN.
- 2 ALL LIGHTING FIXTURES AND FIRE ALARM DEVICES TO BE REMOVED AND REPLACED WITH NEW. REFER TO NEW LIGHTING AND POWER PLANS FOR NEW LOCATIONS.
- 3 EXISTING LIGHTING FIXTURES IN THIS AREA TO REMAIN.





**NOTES:**  
 ① NEW PANELS SUPPORTING EXISTING LOADS. CONTRACTOR TO VERIFY LOADS AND TO PROVIDE NEW PANEL DIRECTORY TO REFLECT LOADS CONNECTED TO PANEL. REFER TO PANEL SCHEDULES FOR MORE DETAILS.

- ROOM SCHEDULE**
- (B01) MEETING ROOM
  - (B02) TRANSITIONAL UNIT 1 (BEDROOM)
  - (B02a) TRANSITIONAL UNIT 1 (KITCHEN/LIVING)
  - (B02b) TRANSITIONAL UNIT 1 (BATHROOM)
  - (B03) MECHANICAL ROOM
  - (B03a) LIFT ROOM
  - (B04) TRANSITIONAL UNIT 2 (BATHROOM)
  - (B04a) TRANSITIONAL UNIT 2 (KITCHEN/LIVING)
  - (B04b) TRANSITIONAL UNIT 2 (BEDROOM)
  - (B05) STUDENTS OFFICE
  - (B05a) COPY ROOM
  - (B06) CORRIDOR
  - (B07) STAFF ROOM
  - (B08) OFFICE
  - (B10) MAINTENANCE ROOM
  - (B10a) ELEVATOR SERVICE ROOM
  - (B12) VOLUNTEER COORDINATOR AND C. OF F. OFFICE
  - (B13) MENS WASHROOM
  - (B14) OFFICE
  - (B15) BARRIER FREE WASHROOM
  - (B16) WOMENS WASHROOM
  - (B20) OFFICE
  - (B21) SECURITY EQUIPMENT
  - (B24) MANAGERS OFFICE
  - (B24a) CORRIDOR
  - (B25) GENERAL OFFICE
  - (B26) MEETING ROOM
  - (B27) MECHANICAL ROOM
  - (B28a) ELECTRICAL ROOM
  - (B28b) ELECTRICAL ROOM
  - (B28c) ELECTRICAL ROOM
  - (B29) WASHROOM
  - (B30) NURSE STATION
  - (B31a) TRANSITIONAL UNIT 3 (WASHROOM)
  - (B31b) TRANSITIONAL UNIT 3 (KITCHEN)
  - (B31c) TRANSITIONAL UNIT 3 (LIVING ROOM)
  - (B31d) TRANSITIONAL UNIT 3 (BEDROOM)
  - (B32) CORRIDOR
  - (B33a) STORAGE
  - (B33b) STORAGE
  - (B34) STORAGE
  - (B35) SHOWER ROOM
  - (B36) WASHROOM
  - (B37) UNASSIGNED
  - (901) EXIT STAIR
  - (902) EXIT STAIR
  - (903) EXIT STAIR
  - (904) EXIT STAIR
  - (905) COMMUNICATION STAIR



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SIGNATURE *David Buck*  
 NAME DAVID BUCK  
 BCIN 21610

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customer  
**YWCA RENEWAL**  
**84 FREDERICK STREET**  
**KITCHENER, ONTARIO**

project  
**BASEMENT PLAN**  
**LIGHTING LAYOUT**

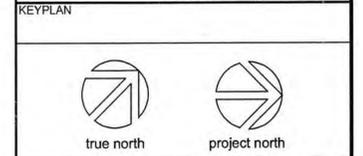
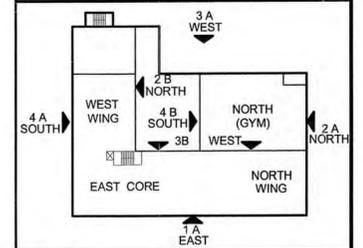
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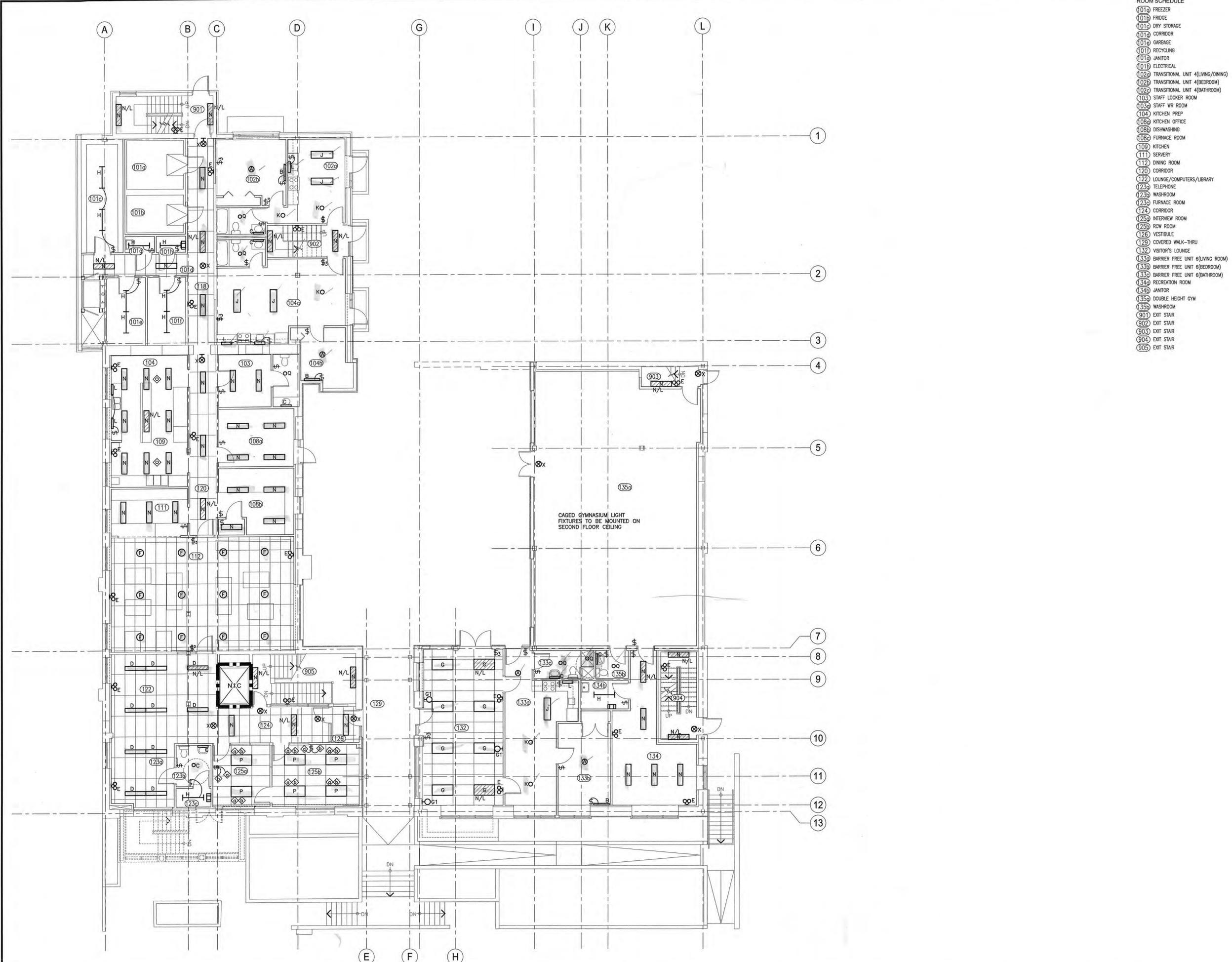
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- ROOM SCHEDULE
- (101) FREEZER
  - (101b) FRIDGE
  - (101c) DRY STORAGE
  - (101d) CORRIDOR
  - (101e) GARBAGE
  - (101f) RECYCLING
  - (101g) JANITOR
  - (101h) ELECTRICAL
  - (102) TRANSITIONAL UNIT 4(LIVING/DINING)
  - (102b) TRANSITIONAL UNIT 4(BEDROOM)
  - (102c) TRANSITIONAL UNIT 4(BATHROOM)
  - (103) STAFF LOCKER ROOM
  - (103a) STAFF WR ROOM
  - (104) KITCHEN PREP
  - (108a) KITCHEN OFFICE
  - (108b) DISHWASHING
  - (108c) FURNACE ROOM
  - (109) KITCHEN
  - (111) SERVERY
  - (112) DINING ROOM
  - (120) CORRIDOR
  - (122) LOUNGE/COMPUTERS/LIBRARY
  - (123a) TELEPHONE
  - (123b) WASHROOM
  - (123c) FURNACE ROOM
  - (124) CORRIDOR
  - (125a) INTERVIEW ROOM
  - (125b) RCW ROOM
  - (126) VESTIBULE
  - (129) COVERED WALK-THRU
  - (132) VISITOR'S LOUNGE
  - (133a) BARRIER FREE UNIT 6(LIVING ROOM)
  - (133b) BARRIER FREE UNIT 6(BEDROOM)
  - (133c) BARRIER FREE UNIT 6(BATHROOM)
  - (134) RECREATION ROOM
  - (134a) JANITOR
  - (134b) DOUBLE HEIGHT GYM
  - (135a) WASHROOM
  - (901) EXIT STAR
  - (902) EXIT STAR
  - (903) EXIT STAR
  - (904) EXIT STAR
  - (905) EXIT STAR



CAGED GYMNASIUM LIGHT FIXTURES TO BE MOUNTED ON SECOND FLOOR CEILING

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 84 FREDERICK STREET  
 KITCHENER, ONTARIO

project  
 GROUND FLOOR PLAN  
 LIGHTING LAYOUT

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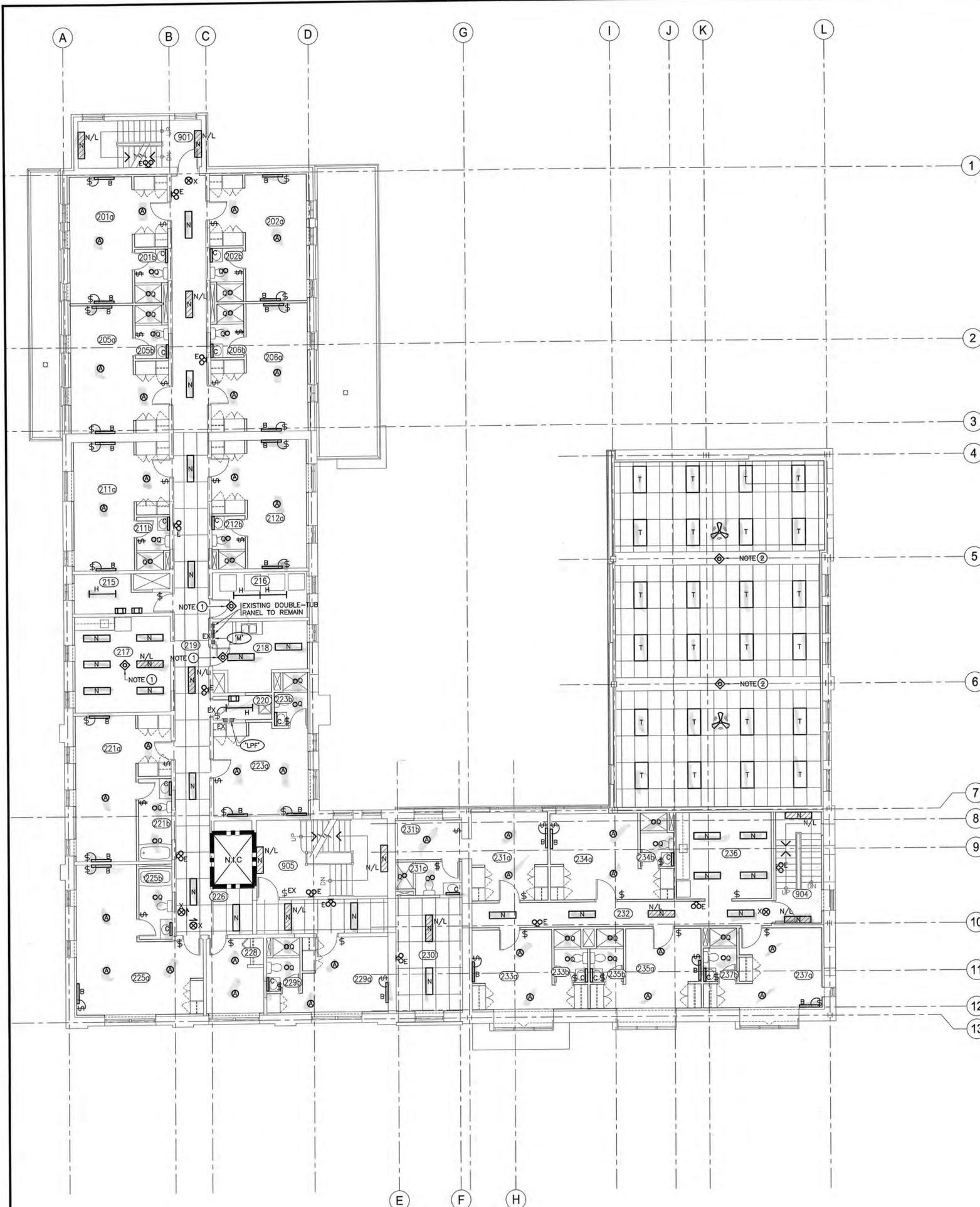
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*David Buck*  
 D. C. BUCK  
 REGISTERED PROFESSIONAL ARCHITECT  
 PROVINCE OF ONTARIO

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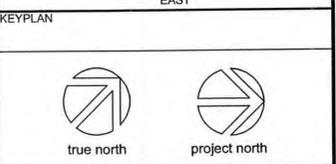
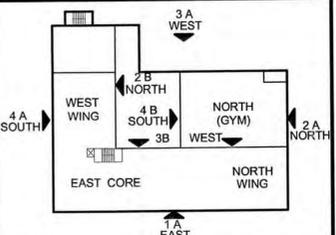
BCIN: **E2-2**



NOTES:  
 ① OCCUPANCY SENSOR, HUBBELL CATALOG #LH-US-W OR APPROVED EQUAL.  
 ② OCCUPANCY SENSOR TO BE MOUNTED ON THE UNDERSIDE OF BEAM, HUBBELL CATALOG #CAU2000 OR APPROVED EQUAL.

**ROOM LEGEND**

- 201a BEDROOM
- 201b BATHROOM
- 202a BEDROOM
- 202b BATHROOM
- 205a BEDROOM
- 205b BATHROOM
- 206a BEDROOM
- 206b BATHROOM
- 211a BEDROOM
- 211b BATHROOM
- 212a BEDROOM
- 212b BATHROOM
- 215 LINEN STORAGE
- 216 LAUNDRY (RESIDENT)
- 217 LOUNGE/KITCHENETTE
- 218 LAUNDRY (STAFF)
- 219 CORRIDOR
- 220 JANITOR
- 221a BEDROOM
- 221b BATHROOM
- 223a BEDROOM
- 223b BATHROOM
- 225a BEDROOM
- 225b BATHROOM
- 228 CORRIDOR
- 228 QUIET ROOM
- 229a BEDROOM
- 229b BATHROOM
- 230 SEATING AREA
- 231a BEDROOM
- 231b BATHROOM
- 232 CORRIDOR
- 233a BEDROOM
- 233b BATHROOM
- 234a BEDROOM
- 234b BATHROOM
- 235a BEDROOM
- 235b BATHROOM
- 236 LOUNGE/KITCHENETTE
- 237a BEDROOM
- 237b BATHROOM
- 901 EXIT STAIR
- 904 EXIT STAIR
- 905 EXIT STAIR



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SIGNATURE *David Buck*  
 NAME *DAVID BUCK*  
 BCIN *21610*

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**84 FREDERICK STREET**  
**KITCHENER, ONTARIO**

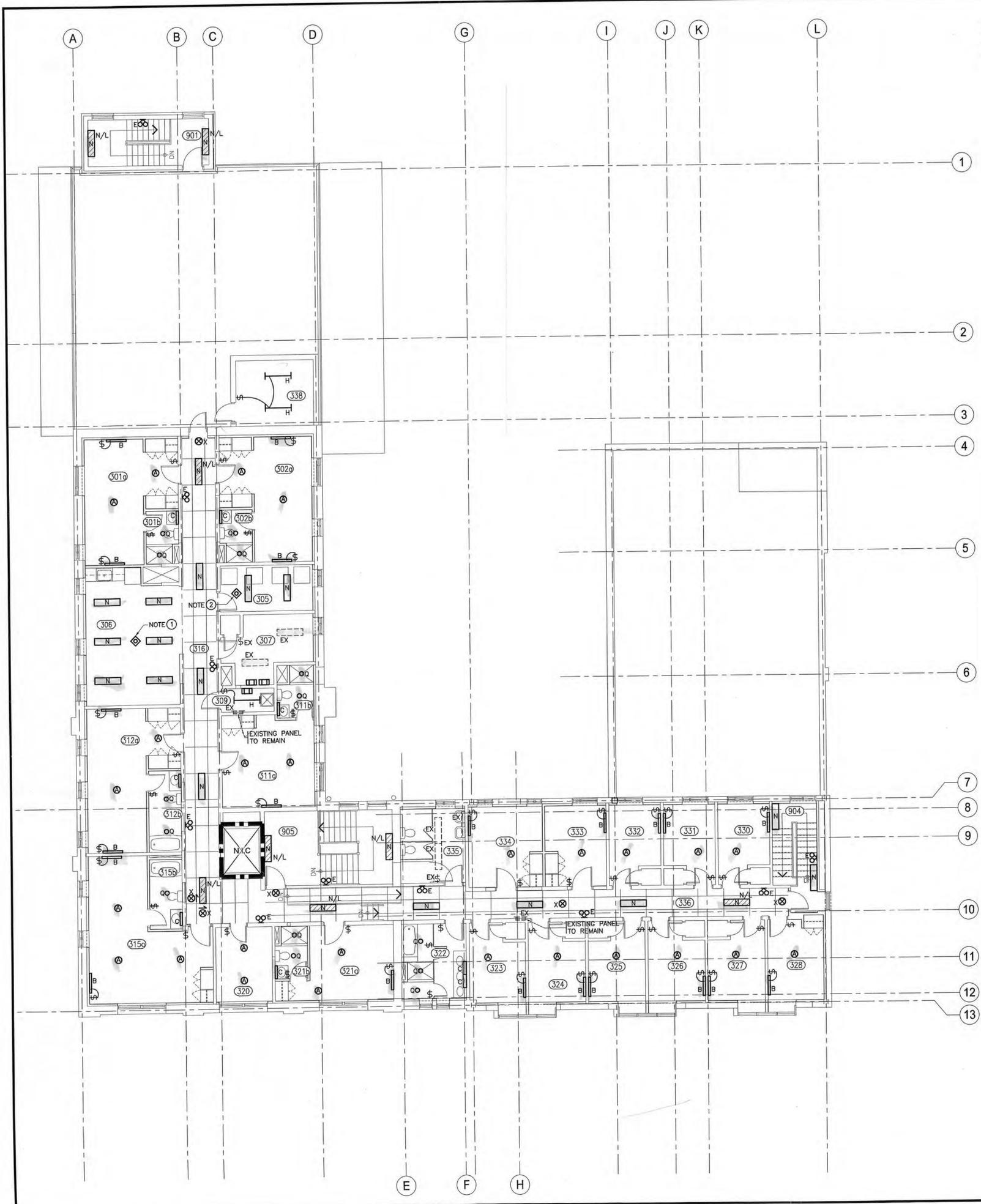
project  
 title  
**SECOND FLOOR PLAN**  
**LIGHTING LAYOUT**

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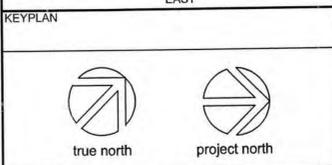
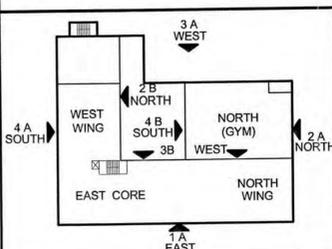
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**ROOM LEGEND**

- ①01a LIVING SPACE
- ①01b BATHROOM
- ①02a LIVING SPACE
- ①02b BATHROOM
- ①03 LAUNDRY
- ①04 OPEN KITCHEN AREA
- ①05 HOUSEKEEPING
- ①06 JANITOR
- ①10a LIVING SPACE
- ①11a BATHROOM
- ①12a LIVING SPACE
- ①12b BATHROOM
- ①15a LIVING SPACE
- ①15b BATHROOM
- ①16 CORRIDOR
- ①20 QUIET ROOM
- ①21a LIVING SPACE
- ①21b BATHROOM
- ①22 BATHROOM
- ①23 BEDROOM (1P)
- ①24 BEDROOM (1P)
- ①25 BEDROOM (1P)
- ①26 BEDROOM (1P)
- ①27 BEDROOM (1P)
- ①28 BEDROOM (1P)
- ①30 BEDROOM (1P)
- ①31 BEDROOM (1P)
- ①32 BEDROOM (1P)
- ①33 BEDROOM
- ①34 LOUNGE
- ①35 WASHROOM
- ①36 CORRIDOR
- ①38 MECHANICAL ROOM
- ①01 EXIT STAIR
- ①04 EXIT STAIR
- ①05 COMMUNICATION STAIR



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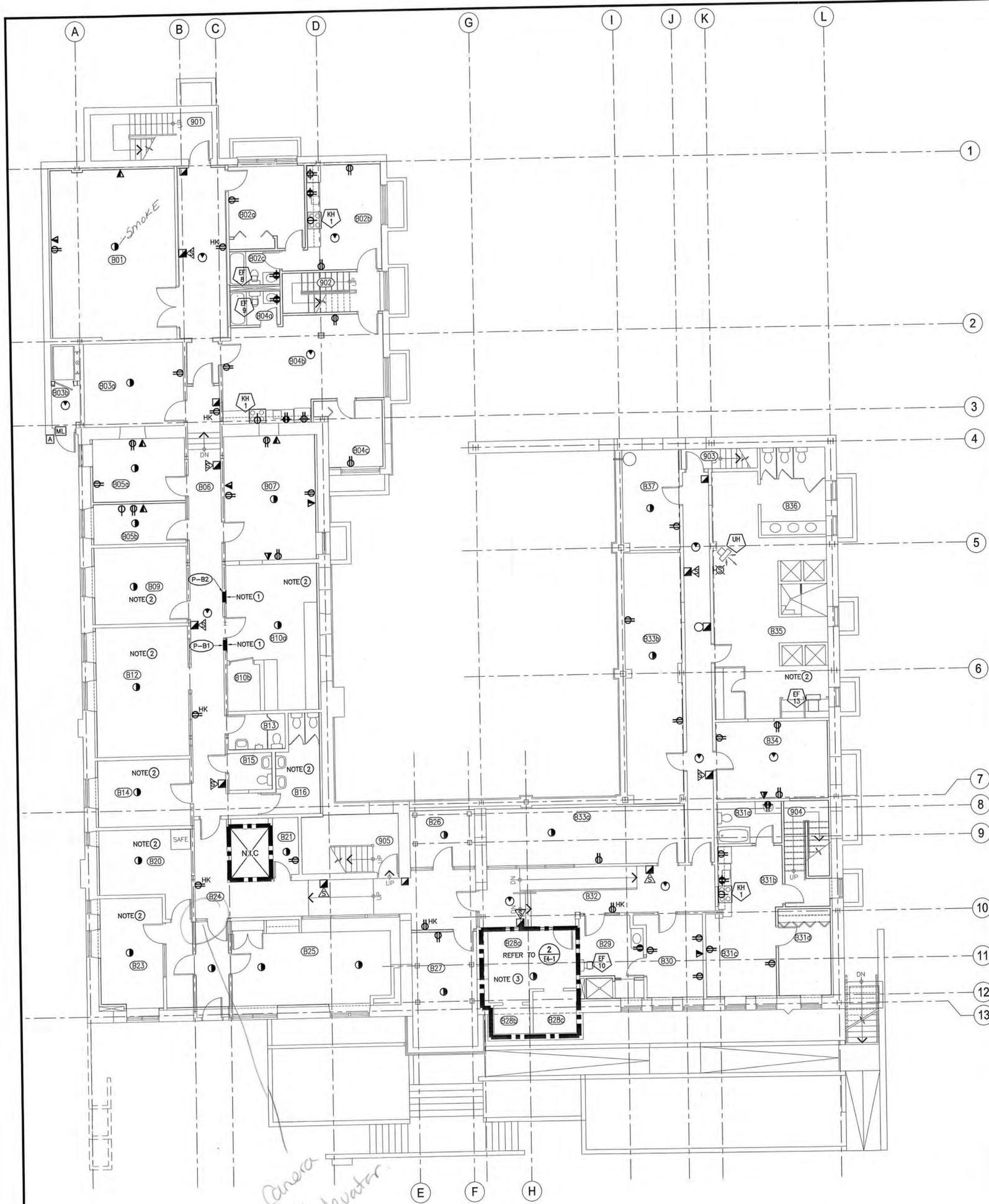
project

title  
**THIRD FLOOR PLAN**  
**LIGHTING LAYOUT**

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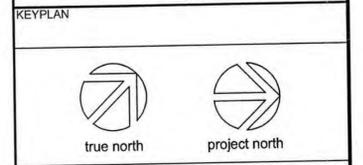
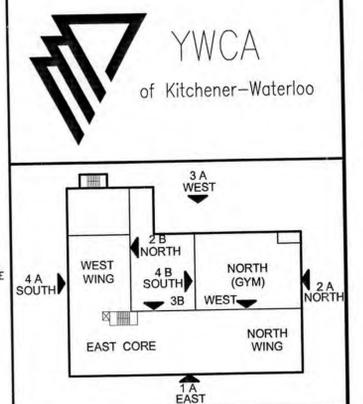
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 checked by:  
 BCIN: sheet no.: **E2-4**



- NOTES:**
- 1 NEW PANELS SUPPORTING NEW AND EXISTING LOADS. REFER TO PANEL SCHEDULES FOR MORE DETAILS.
  - 2 EXCEPT FOR FIRE ALARM DEVICES, THERE IS NO ELECTRICAL WORK IN THIS AREA.
  - 3 REFER TO ARCHITECTURAL DRAWINGS FOR MORE INFORMATION ON PROJECT PHASING.

- ROOM SCHEDULE**
- B01 MEETING ROOM
  - B02 TRANSITIONAL UNIT 1 (BEDROOM)
  - B02a TRANSITIONAL UNIT 1 (KITCHEN/LIVING)
  - B02b TRANSITIONAL UNIT 1 (BATHROOM)
  - B03 MECHANICAL ROOM
  - B03a LIFT ROOM
  - B04 TRANSITIONAL UNIT 2 (BATHROOM)
  - B04a TRANSITIONAL UNIT 2 (KITCHEN/LIVING)
  - B04b TRANSITIONAL UNIT 2 (BEDROOM)
  - B05 STUDENTS OFFICE
  - B05a COPY ROOM
  - B06 CORRIDOR
  - B07 STAFF ROOM
  - B09 OFFICE
  - B10 MAINTENANCE ROOM
  - B10a ELEVATOR SERVICE ROOM
  - B12 VOLUNTEER COORDINATOR AND C O F OFFICE
  - B13 MENS WASHROOM
  - B14 OFFICE
  - B15 BARRIER FREE WASHROOM
  - B16 WOMENS WASHROOM
  - B20 OFFICE
  - B21 SECURITY EQUIPMENT
  - B23 MANAGERS OFFICE
  - B24 CORRIDOR
  - B25 GENERAL OFFICE
  - B26 MEETING ROOM
  - B27 MECHANICAL ROOM
  - B28a ELECTRICAL ROOM
  - B28b ELECTRICAL ROOM
  - B28c ELECTRICAL ROOM
  - B29 WASHROOM
  - B30 NURSE STATION
  - B31 TRANSITIONAL UNIT 3 (WASHROOM)
  - B31a TRANSITIONAL UNIT 3 (KITCHEN)
  - B31b TRANSITIONAL UNIT 3 (LIVING ROOM)
  - B31c TRANSITIONAL UNIT 3 (BEDROOM)
  - B32 CORRIDOR
  - B33a STORAGE
  - B33b STORAGE
  - B34 STORAGE
  - B35 SHOWER ROOM
  - B36 WASHROOM
  - B37 UNASSIGNED
  - 901 EXIT STAIR
  - 902 EXIT STAIR
  - 903 EXIT STAIR
  - 904 EXIT STAIR
  - 905 COMMUNICATION STAIR



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 NAME: DAVID BUCK  
 BCIN: 21610

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**84 FREDERICK STREET**  
**KITCHENER, ONTARIO**

project

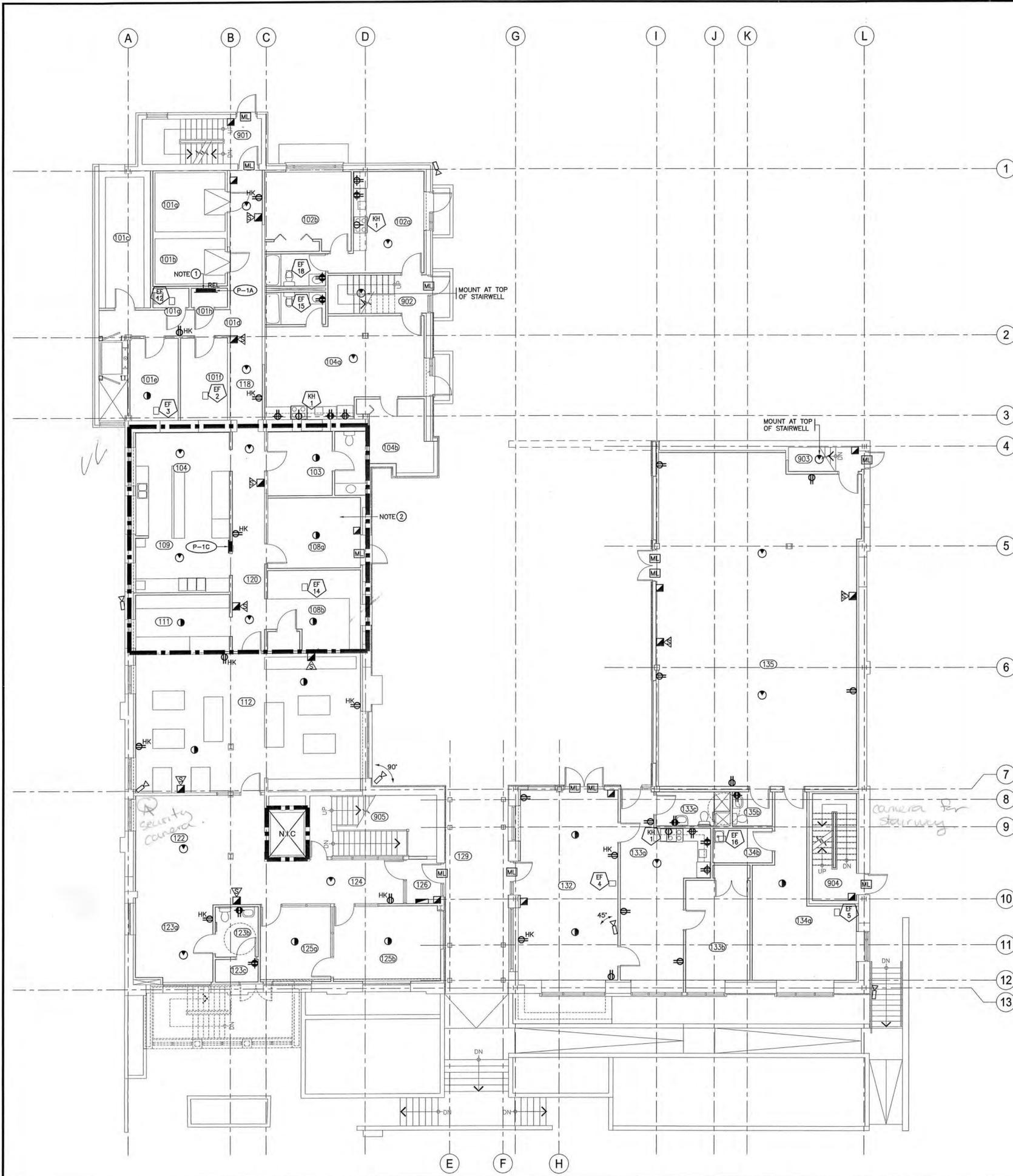
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**POWER AND SYSTEMS**  
**LAYOUT**

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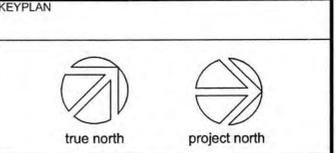
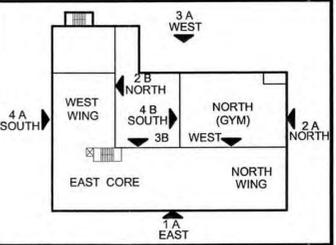
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 date: 12/20/2005  
 job no.: 2004-0433-10  
 CAD file: E2-5\_2004-0433-10  
 drawn by: JP  
 checked by:

BCIN: sheet no.: **E2-5**



- NOTES:
- EXISTING PANEL, PREVIOUSLY LOCATED IN DAYCARE AREA, TO BE RE-USED FOR NEW LOADS. REFER TO DEMOLITION PLANS FOR LOCATION AND PANELS SCHEDULE FOR NEW CIRCUIT ASSIGNMENTS.
  - REFER TO ENLARGED KITCHEN PLAN FOR EQUIPMENT DETAILS.

- ROOM SCHEDULE
- (010) FREEZER
  - (011) FRIDGE
  - (012) DRY STORAGE
  - (013) CORRIDOR
  - (014) GARBAGE
  - (015) RECYCLING
  - (016) JANITOR
  - (017) ELECTRICAL
  - (020) TRANSITIONAL UNIT 4(LIVING/DINING)
  - (021) TRANSITIONAL UNIT 4(BEDROOM)
  - (022) TRANSITIONAL UNIT 4(BATHROOM)
  - (030) STAFF WR. ROOM
  - (031) STAFF LOCKER ROOM
  - (032) STAFF WR. ROOM
  - (040) KITCHEN PREP
  - (080) KITCHEN OFFICE
  - (081) DISHWASHING
  - (082) FURNACE ROOM
  - (090) KITCHEN
  - (110) SERVERY
  - (111) DINING ROOM
  - (120) CORRIDOR
  - (122) LOUNGE/COMPUTERS/LIBRARY
  - (123) TELEPHONE
  - (123a) WASHROOM
  - (123b) FURNACE ROOM
  - (124) CORRIDOR
  - (125) INTERVIEW ROOM
  - (125a) ROW ROOM
  - (126) VESTIBULE
  - (129) COVERED WALK-THRU
  - (132) VISITOR'S LOUNGE
  - (133a) BARRIER FREE UNIT 6(LIVING ROOM)
  - (133b) BARRIER FREE UNIT 6(BEDROOM)
  - (133c) BARRIER FREE UNIT 6(BATHROOM)
  - (134) RECREATION ROOM
  - (134a) JANITOR
  - (135a) DOUBLE HEIGHT GYM
  - (135b) WASHROOM
  - (901) EXIT STAIR
  - (902) EXIT STAIR
  - (903) EXIT STAIR
  - (904) EXIT STAIR
  - (905) EXIT STAIR



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SIGNATURE David Buck

NAME DAVID BUCK

BCIN 21610

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date revisions

customer

**YWCA RENEWAL**  
84 FREDERICK STREET  
KITCHENER, ONTARIO

project

title

**GROUND FLOOR PLAN**  
ELECTRICAL POWER AND  
SYSTEMS LAYOUT

**THE walterfedy PARTNERSHIP**  
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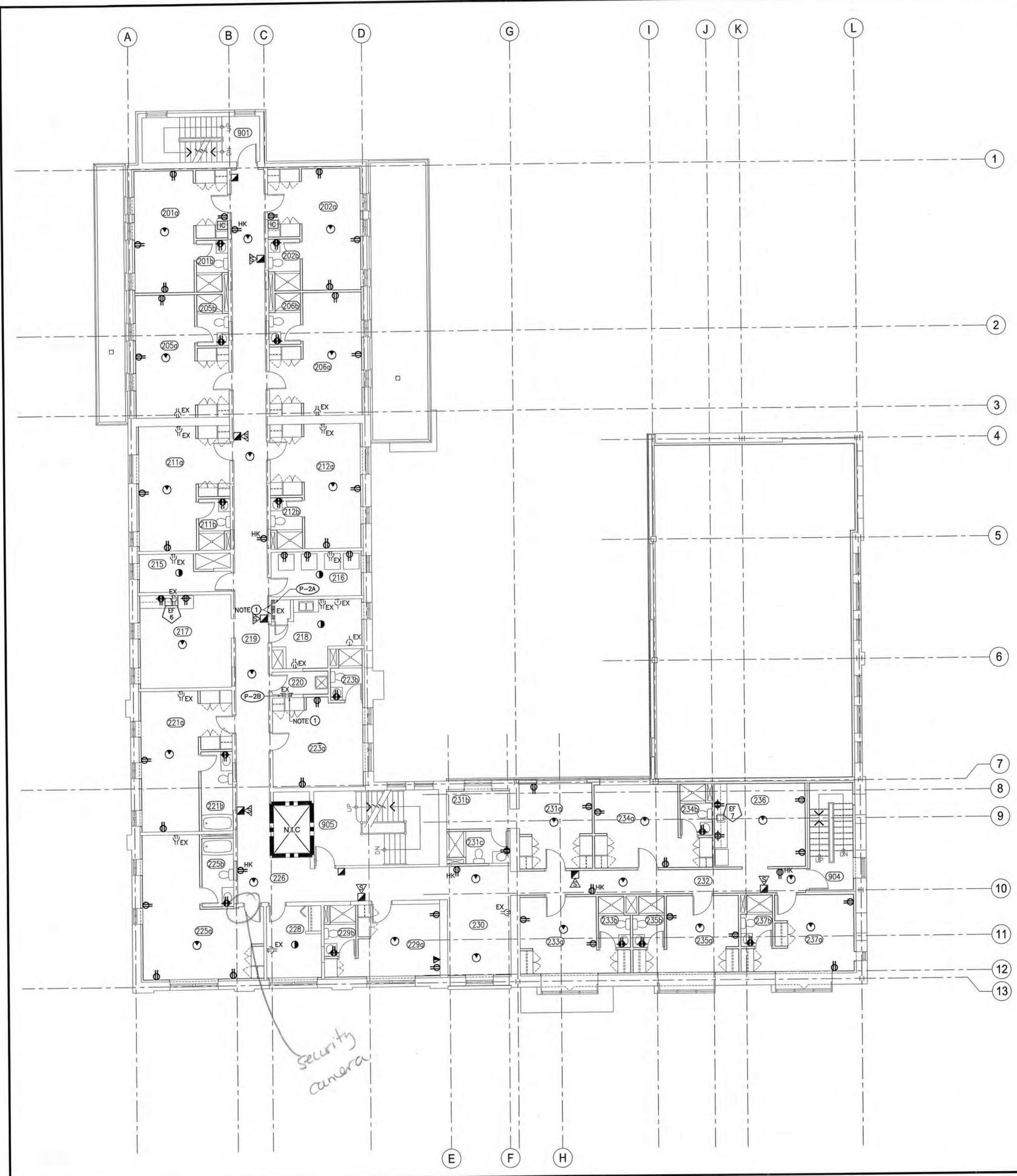
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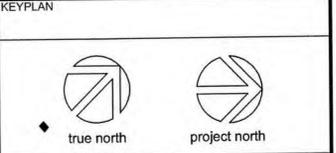
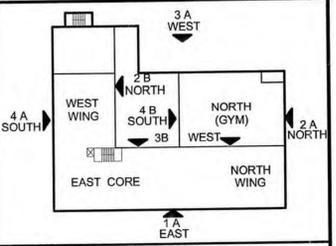
BCIN: sheet no. **E2-6**



NOTES:  
 1 EXISTING DOUBLE TUB PANEL TO REMAIN.  
 RE-LABEL AS SHOWN ON DRAWING.

**ROOM LEGEND**

- 201a BEDROOM
- 201b BATHROOM
- 202a BEDROOM
- 202b BATHROOM
- 205a BEDROOM
- 205b BATHROOM
- 206a BEDROOM
- 206b BATHROOM
- 211a BEDROOM
- 211b BATHROOM
- 212a BEDROOM
- 212b BATHROOM
- 215 LINEN STORAGE
- 216 LAUNDRY (RESIDENT)
- 217 LOUNGE/KITCHENETTE
- 218 LAUNDRY (STAFF)
- 219 CORRIDOR
- 220 JANITOR
- 221a BEDROOM
- 221b BATHROOM
- 223a BEDROOM
- 223b BATHROOM
- 225a BEDROOM
- 225b BATHROOM
- 226 CORRIDOR
- 228 QUIET ROOM
- 229a BEDROOM
- 229b BATHROOM
- 230 SEATING AREA
- 231a BEDROOM
- 231b BEDROOM
- 231c BATHROOM
- 232 CORRIDOR
- 233a BEDROOM
- 233b BATHROOM
- 234a BEDROOM
- 234b BATHROOM
- 235a BEDROOM
- 235b BATHROOM
- 236 LOUNGE/KITCHENETTE
- 237a BEDROOM
- 237b BATHROOM
- 901 EXIT STAIR
- 904 EXIT STAIR
- 905 EXIT STAIR



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customer  
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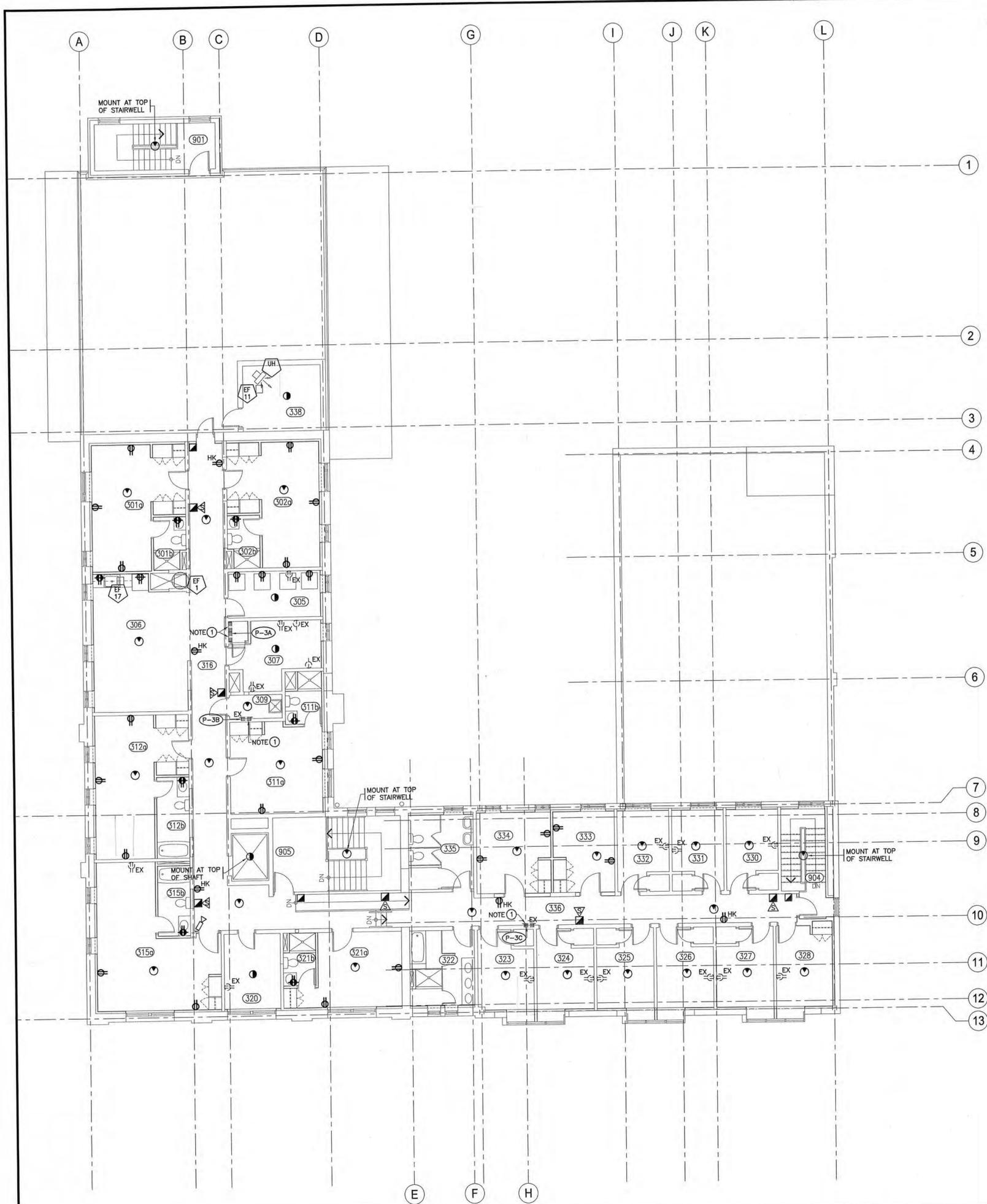
project  
 title  
 SECOND FLOOR PLAN  
 ELECTRICAL POWER AND  
 SYSTEMS LAYOUT



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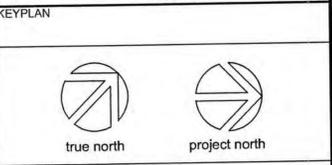
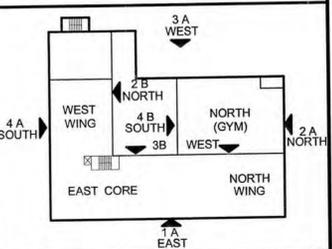
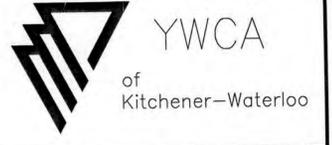
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 checked by:  
 BCIN:  
 sheet no.: **E2-7**



NOTES:  
 ① EXISTING DOUBLE TUB PANEL TO REMAIN.  
 RE-LABEL AS SHOWN ON DRAWING.

**ROOM LEGEND**

- 301a LIVING SPACE
- 301b BATHROOM
- 302a LIVING SPACE
- 302b BATHROOM
- 305 LAUNDRY
- 306 OPEN KITCHEN AREA
- 307 HOUSEKEEPING
- 309 JANITOR
- 311a LIVING SPACE
- 311b BATHROOM
- 312a LIVING SPACE
- 312b BATHROOM
- 315a LIVING SPACE
- 315b BATHROOM
- 316 CORRIDOR
- 318 QUIET ROOM
- 319 LIVING SPACE
- 320 BATHROOM
- 321 BATHROOM
- 322 BATHROOM
- 323 BEDROOM (1P)
- 324 BEDROOM (1P)
- 325 BEDROOM (1P)
- 326 BEDROOM (1P)
- 327 BEDROOM (1P)
- 328 BEDROOM (1P)
- 330 BEDROOM (1P)
- 331 BEDROOM (1P)
- 332 BEDROOM (1P)
- 333 BEDROOM
- 334 LOUNGE
- 335 WASHROOM
- 336 CORRIDOR
- 338 MECHANICAL ROOM
- 901 EXIT STAIR
- 904 EXIT STAIR
- 905 COMMUNICATION STAIR



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 NAME *DAVID BUCK*  
 BCIN *21610*

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**YWCA RENEWAL**  
**84 FREDERICK STREET**  
**KITCHENER, ONTARIO**

project  
**THIRD FLOOR PLAN**  
**ELECTRICAL POWER AND**  
**SYSTEMS LAYOUT**

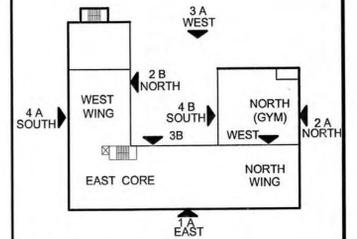
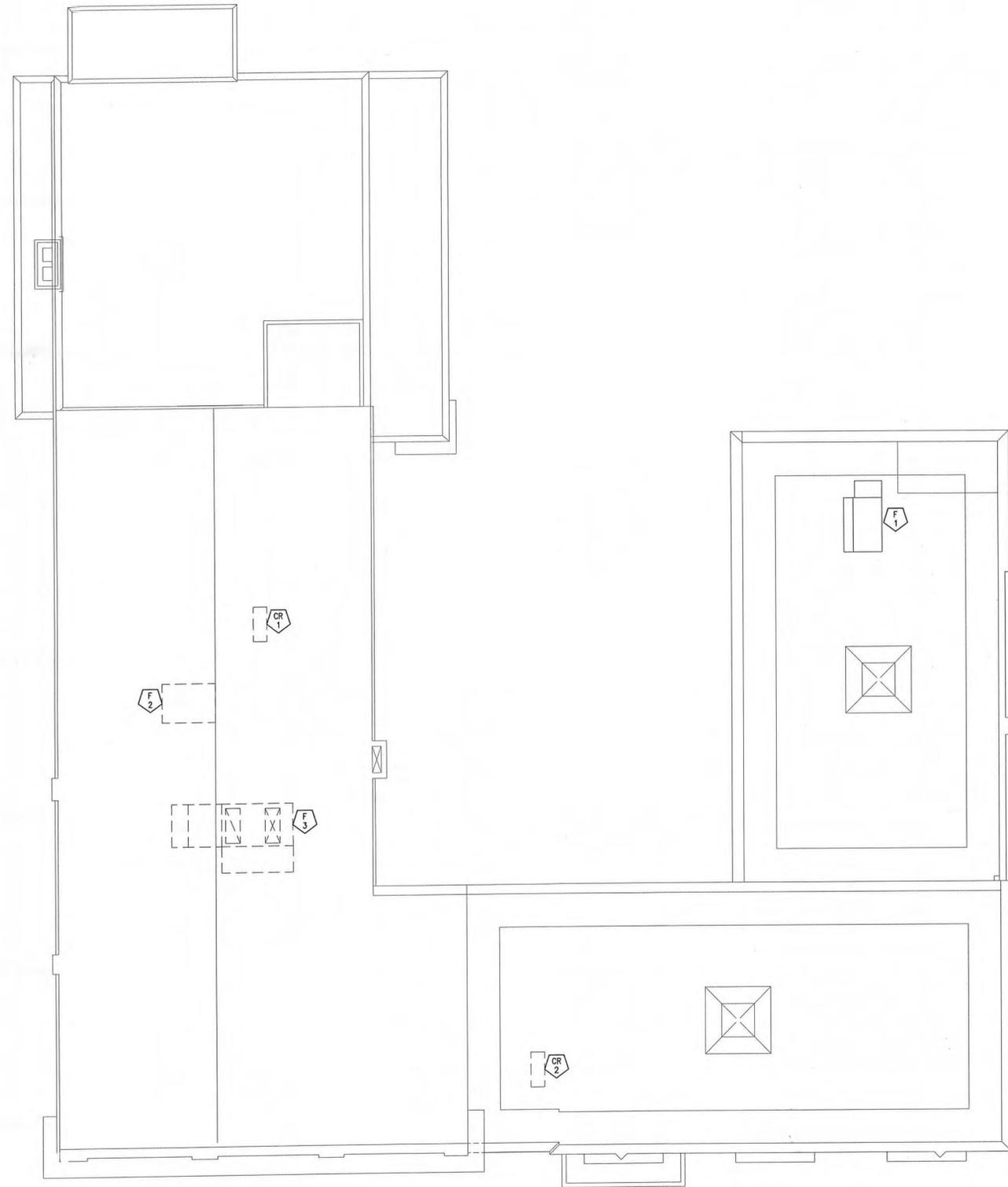


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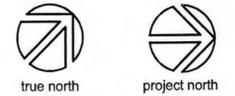


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**E2-8**



KEYPLAN



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 84 FREDERICK STREET  
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project  
 YWCA RENEWAL  
 84 FREDERICK STREET  
 KITCHENER, ONTARIO

title  
 ROOF PLAN  
 ELECTRICAL LAYOUTS  
 LIGHTING, POWER & SYSTEMS



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 sheet no.: **E2-9**

LIGHTING FIXTURES SCHEDULE

TYPE	MANUFACTURER	MODEL	CATALOGUE NUMBER	NUMBER AND TYPE OF LAMPS	MOUNTING TYPE OF LAMPS	MOUNTING HEIGHT	REMARKS
A	THOMAS	MULTI-PURPOSE	SL7549	3-60W	SD		RESIDENCES
B	DAY-BRITE	HOSPITAL	CHC232-B-54	2-32W T8	W		NOMINAL 3' LONG
C	THOMAS RESIDENTIAL	VANITY LIGHT	FW 217-EB	2-17W T8	W		
D	METALUMEN	SUSPENDED LINEAR	C3M-B-4-C-P-4 12"-W-4-A	2-32W T8	SD		
E	LUMACELL	EMERGENCY HEADS	RS20-6V9W	9W PAR36	S		PROVIDE BATTERY PACK LUXNET INDY12-160
F	DAY-BRITE	EXPRESSIONS	LLA150-M12-CUL WT-AR16	1-A16 INCAND.	SD		DINING AREA
G	DAY-BRITE	ARIOSO LOUVRE	2AVG232-LMWP- 120-CM	2-32W T8	R		RECEPTION
G1	HALO	PORTRAIT WALL SCONCE	H2525-MC	2-13W PL	S		RECEPTION
H	LITHONIA	STRIPLIGHT	EJS-232-120 GEB10RS-WGL	2-32W T8	S		
J	THOMAS RESIDENTIAL	1 X 4 SURFACE	FD 232-8 CTEB	2-32W T8	R		RESIDENCES
K	THOMAS	CEILING MOUNTED	SL326-8	2-60W T8	S		RESIDENCES
L	THOMAS	UNDERCABINET	FA120-8	1-20W T12	S		RESIDENCES
M	THOMAS	1 X 4 RECESSED	1GRS232-FS21- 120	2-32W T8	R		
N	THOMAS	1 X 4 SURFACE	SM232-FS21-120	2-32W T8	S		CORRIDORS
P	THOMAS	VDT ULTRA 2 X 4 PARABOLIC	2UCGS6332- 39SL-120	2-32W T8	R		OFFICES
Q	OMEGA	SHOWER LIGHT	OM62H26QPLSRD- SWR-120	2-26QPL	R		
R	THOMAS	VDT ULTRA 2 X 4 PARABOLIC	2UCGSF332- 39SL-120	3-32W T8	R		OFFICES
S	LITHONIA	UTILITARIAN	VR2-120-EC- CSA-LPI	1-25W INCAND.	W		
T	DAY-BRITE	GYM-LUME	GYMW232-12-120	2-32W T8	S		GYM
U	GARDCO	CANOPY RECESSED	220C-70CMHE	1-70W MH	R		
V	GARDCO	STEPLIGHT	841-C-13QF-DG 120-BRP	13W QUAD CF	R		
W	KEENE	WALL SCONCE	CW-M-100-A-1	1-100W MH	S		
X	EXIT SIGN	LUMACELL	LER20-0-W-GW- SPD-FT	LED	S		
Y	GARDCO	LIGHT COLUMN	LD600-C42-70MH 120-BRP	1-70 MH	R		
Z	KEENE	WALL SCONCE	GS30-242-4-HF L-1	2-42W CF	S		

LIGHTING FIXTURE SCHEDULE NOTES:

- UNLESS SPECIFICALLY INDICATED OTHERWISE, THE FOLLOWING NOTATIONS APPLY TO ALL FIXTURES IN SCHEDULE AND ON DRAWINGS REGARDLESS IF INFORMATION IS SPECIFICALLY NOTED IN CATALOG NUMBER OR NOT.
- ALL BALLASTED FIXTURES SHALL UTILIZE HIGH POWER FACTOR (HPF) STYLE BALLASTS.
  - ALL FLUORESCENT FIXTURES SHALL UTILIZE ELECTRONIC BALLASTS.
  - ALL FLUORESCENT LAMP COLOUR TEMPERATURES SHALL BE 4100°K IN OPEN OFFICE AREAS AND 3500°K IN WASHROOM/BATHROOM FACILITIES.
  - ALL H.I.D. METAL HALIDE FIXTURES 1000W AND LESS SHALL BE "PULSE START" STYLE.
  - STANDARD COLOUR FINISH FOR ALL FIXTURE ENCLOSURES, BODIES AND TRIMS SHALL BE AS FOLLOWS:  
-INTERIOR - WHITE  
-EXTERIOR - BRONZE  
ALL FINISHES SHALL BE ELECTROSTATICALLY APPLIED.
  - ALL EXIT SIGNS SHALL BE DESIGNED TO MEET CSA CRITERIA #CSA-C860-96 AND SHALL BE C/W UNIVERSAL ARROWS AND MOUNTING SYSTEM.

WIRING FOR MECHANICAL EQUIPMENT SCHEDULE

MECHANICAL	EQUIPMENT NAME OR DESCRIPTION	MOTOR			STARTERS												REMARKS				
		VOLTAGE	HORSEPOWER	PHASE	MANUAL	MAGNETIC	COMBINATION	H-O-A	ON-OFF SELECTION SW.	STOP-START PUSH BUTTON	PILOT LIGHT	CONTROL VOLTAGE	PANEL BREAKER	DISCONNECT	INTEGRAL CONT. STARTER	UNIT MTD. CONNECT BOX		WIRED BY			
F1	GYM HEATING/VENTILATING UNIT	208	2 HP	3				E										E	EF 1		
F2	KITCHEN MAKE-UP AIR	208	2 HP	3				E											E	EF 2	
F3	HEAT RECOVERY UNIT C/W COOLING	208	93 MCA	3									E	E					E		
F4	LOUNGE AC UNIT	208	16 MCA	1																	
F5	DINING AC UNIT	208	16 MCA	1																	
CR 1	ROOF CONDENSING UNIT	208	13 MCA	3				E					E	E					E		
CR 2	ROOF CONDENSING UNIT	208	13 MCA	3				E					E	E					E		
EF 1	KITCHEN HOOD EXHAUST	208	1.5 HP	3																F1	
EF 2	EXHAUST FAN	120	FHP	1										E					E		ELECTRICAL REQUIREMENTS TYPICAL FOR EF-2 THROUGH EF-12 AND EF-14 THROUGH EF-18.
EF 13	EXHAUST FAN	120	1/3 HP	1										E					E		
KH 1	KITCHEN HOOD	120	FHP	1																	
B 1	GAS BOILER	120	2.8 MCA	1																P1	
B 2	GAS BOILER	120	2.8 MCA	1																P2	
P 1	SUMP PUMP	208	1/3 HP	3									E	E					E	B1	
P 2	RECIRC. PUMP	208	1/6 HP	3									E	E					E	B2	
P 3	HEATING PUMP	208	2 HP	3									E	E					E		
P 4	HEATING PUMP	208	2 HP	3									E	E					E		
WS 1	WATER SOFTENER	120	FHP	1										E					E		
WH 1	GAS WATER HEATER	120	FHP	1										E					E		
WH 2	GAS WATER HEATER	120	FHP	1										E					E		
UH 1	UNIT HEATER	120	FHP	1										E					E		
UH 2	UNIT HEATER	120	FHP	1										E					E		



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NAME: DAVID BUCK  
BCIN: 21610

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customer  
YWCA RENEWAL  
84 FREDERICK STREET  
KITCHENER, ONTARIO

project

title  
FIXTURE SCHEDULE AND  
WIRING FOR MECHANICAL  
EQUIPMENT SCHEDULE



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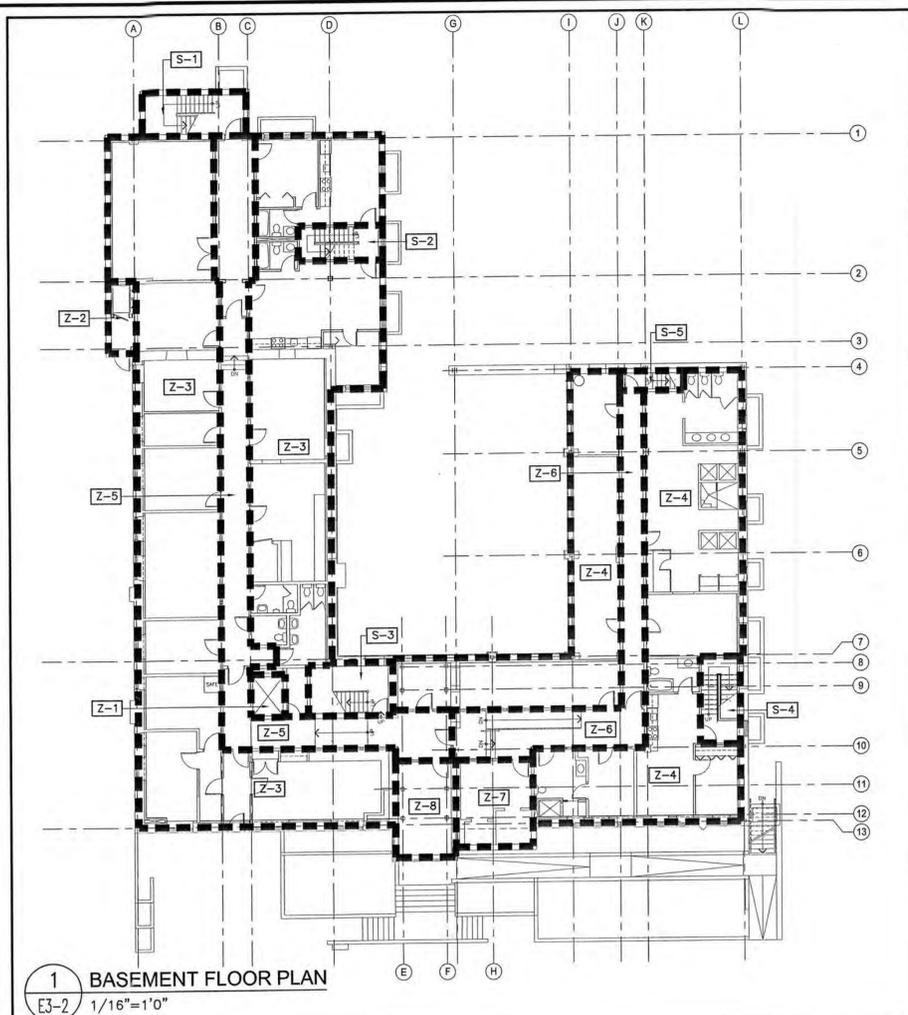
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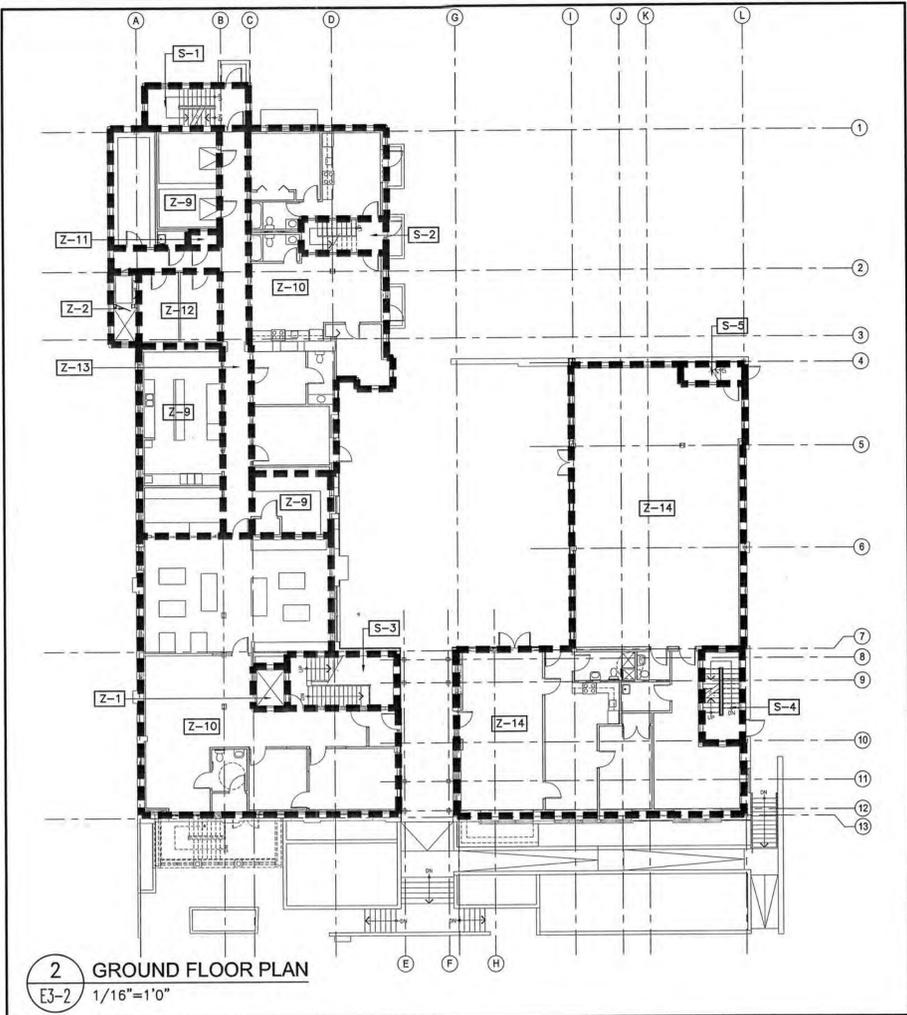
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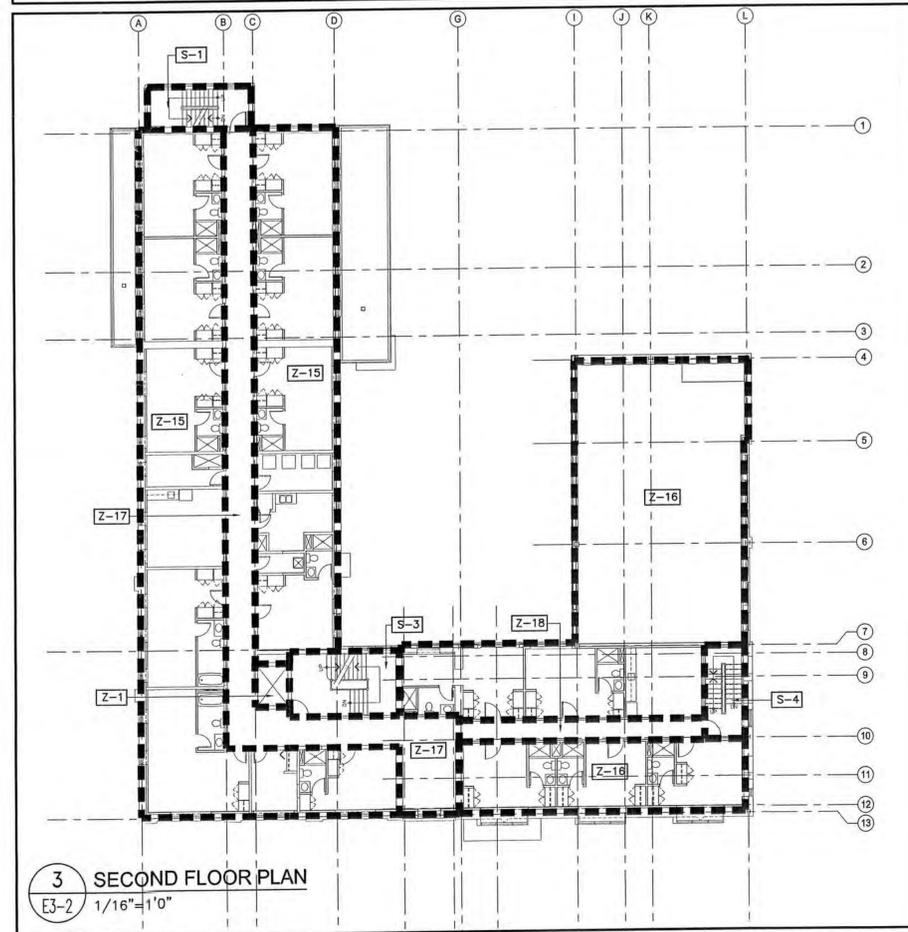
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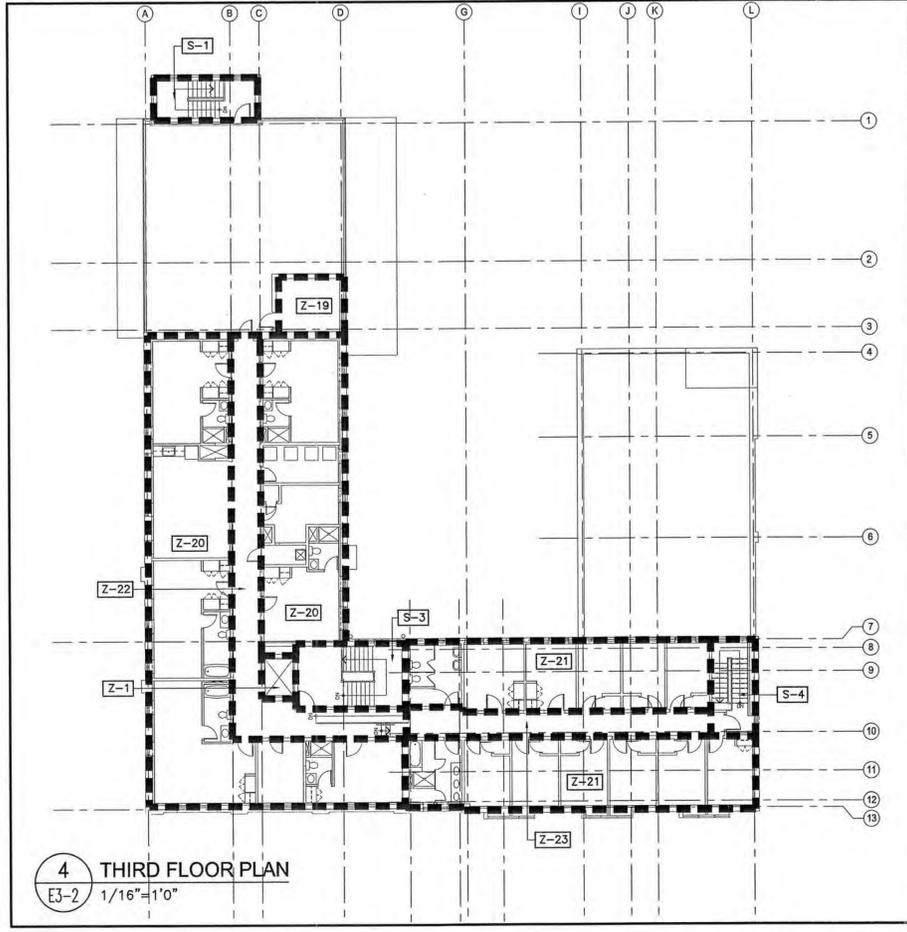
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E3-2 1/16"=1'0"



2 GROUND FLOOR PLAN  
E3-2 1/16"=1'0"

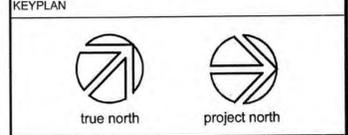
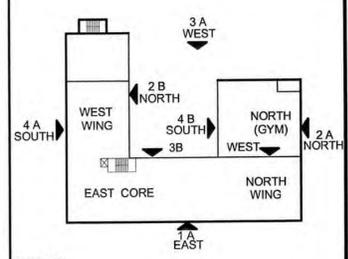


3 SECOND FLOOR PLAN  
E3-2 1/16"=1'0"



4 THIRD FLOOR PLAN  
E3-2 1/16"=1'0"

EXISTING ZONES				
ZONE	DESCRIPTION	NEW	EXIST.	COMMENTS
S-1	STAIRWAY	*		
S-2	STAIRWAY	*		
S-3	STAIRWAY	*		
S-4	STAIRWAY	*		
S-5	STAIRWAY	*		
Z-1	ELEVATOR SHAFT	*		
Z-2	LIFT SHAFT	*		
Z-3	BASEMENT - SOUTH WING	*		
Z-4	BASEMENT - NORTH WING	*		
Z-5	BASEMENT - SOUTH WING CORRIDOR	*		
Z-6	BASEMENT - NORTH WING CORRIDOR	*		
Z-7	BASEMENT - MAIN ELECTRICAL ROOM	*		
Z-8	BASEMENT - MECHANICAL ROOM	*		
Z-9	GRD. FLOOR - FREEZERS/KITCHEN	*		
Z-10	GRD. FLR. - RES./OFFICES/COMMON AREAS	*		
Z-11	GRD. FLOOR - ELECTRICAL CLOSET	*		
Z-12	GRD. FLOOR - GARBAGE/RECYCLING	*		
Z-13	GRD. FLOOR - SOUTH CORRIDOR	*		
Z-14	GRD. FLOOR - NORTH WING	*		
Z-15	2ND FLOOR - SOUTH WING	*		
Z-16	2ND FLOOR - NORTH WING	*		
Z-17	2ND FLOOR - SOUTH WING CORRIDOR	*		
Z-18	2ND FLOOR - NORTH WING CORRIDOR	*		
Z-19	3RD FLOOR - SOUTH WING MECH. ROOM	*		
Z-20	3RD FLOOR - SOUTH WING	*		
Z-21	3RD FLOOR - NORTH WING	*		
Z-22	3RD FLOOR - SOUTH WING CORRIDOR	*		
Z-23	3RD FLOOR - NORTH WING CORRIDOR	*		



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SIGNATURE *David Buck*  
NAME DAVID BUCK  
BCIN 21610

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84 FREDERICK STREET  
KITCHENER, ONTARIO

project  
YWCA RENEWAL  
84 FREDERICK STREET  
KITCHENER, ONTARIO

title  
FIRE ALARM  
ZONING PLANS

**THE walterfedy PARTNERSHIP**  
ARCHITECTS • ENGINEERS

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BCIN: **E3-2**  
sheet no.:

