

**Senior Services and Long-Term Care
City Of Toronto**

**VARIOUS HOMES
INTERIOR UPGRADES 2024**

**PROJECT MANUAL
VOLUME 1 – 21511.F06
(1 OF 2)**

ISSUED FOR RETENDER
JUNE 2024

MSA PROJECT NO: 21511.F06
(INCLUDING 21504.F05, 21508.F06, 21509.F03, 21509.F04 AND 21509.F05)

MONTGOMERY SISAM ARCHITECTS INC.
OJDROVIC ENGINEERING
CROSSEY ENGINEERING LTD.
CROSSEY ENGINEERING LTD.
KAIZEN FOODSERVICE PLANNING & DESIGN INC.

ARCHITECTURAL
STRUCTURAL
ELECTRICAL
MECHANICAL
FOODSERVICE

NO	1
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1 **SUMMARY OF WORK**

1.1 Work under this Contract covers the following major items.

1.2 The Scope of Work for this Project is to include, but not be limited to the following:

- .1 Replacing flooring on 4th floor at Lakeshore Lodge,
Replacing flooring on 2nd floor at Cummer Lodge,
Inclusion of new pot wash and servery at Seven Oaks,
Replacing doors at Seven Oaks,
Replacing flooring of Ground floor at Seven Oaks.

2 **ALTERNATIVES**

2.1 All alternatives must be submitted with the bid using Appendix SA.

3 **PHASING OF THE WORK**

3.1 The Work of this Contract shall be performed in phases. All Phasing will be subject to approval from the Building Services Manager and as identified in the Ministry Of Health Operational Plan for the Work.

4 **WORK RESTRICTIONS**

4.1 Contractor's Use Of Site:

- .1 Use of site is limited to immediate areas of work. Areas designated for storage of material and equipment where specific to the project, are to be coordinated with the Owner and Building Services Manager.
- .2 Do not unreasonably encumber site with materials or equipment. Move stored products or equipment which interfere with operations of Owner and Building Services Manager, or other Contractors. Obtain and pay for use of off-site additional storage, or work areas as required by the Work.

- .3 Sign-in procedures: All Contractors/Subcontractors should sign-in daily meeting City of Toronto standards and CAN/CSA Z317.13 -12 - Infection Control During Construction, Renovation, and Maintenance of Health Care Facilities.

4.2 Coordination with Occupants:

- .1 Coordinate performance and sequencing of the Work with the Owner. Notify the Owner 48 hours in advance of noise-generating activities or interruption of any building services which may disrupt normal operations. Do not interrupt building services without Owner's and Building Services Manager's permission.

4.3 Hours of Work:

- .1 Hours of work for this contract are generally confined to 8:00am to 5:00pm Monday to Friday. Where required by sequencing of the Work, or where shutdown of building services is required, portions of the Work may be required to be performed outside of regular daily business hours, or on weekends. All Hours of Work permitted will be subject to approval from the Building Services Manager and will be as identified in the Ministry Of Health Operational Plan for the Work.

5 **PROJECT MANAGEMENT & COORDINATION**

5.1 Project Coordination:

- .1 Contractor is responsible for the overall coordination of the Work. Coordinate the work of all subcontractors, and provide such assistance as is necessary, including but not limited to;
 - .1 Providing site dimensions and layout,
 - .2 Providing temporary facilities and controls,
 - .3 Scheduling subcontractors work to prevent conflicts,
 - .4 Scheduling and administering regular subtrade scheduling and coordination meetings throughout progress of the Work.
 - .5 Scheduling and administering regular subtrade safety meetings throughout progress of the Work.
- .2 Contractor shall facilitate production of interference drawings where necessary for coordination of the Work. Provide such interference drawings to the Consultant for review.
- .3 Coordinate with Owner as required for any Owner supplied and installed items required by this Project. Provide miscellaneous blocking and mounting as required for intended items.

5.2 Project Meetings:

- .1 Schedule and administer regular project progress meetings throughout progress of work. Frequency of meetings as agreed by Owner Consultants and Contractor at start-up meeting. The minimum for progress meeting shall be bi-weekly.

- .2 Distribute written notice of each meeting to Owner & Consultants four days in advance of meeting date. Indicate full agenda of coming meeting.
 - .3 Contractor shall submit meeting notes within 24 hours of the meeting and from these records and other notes the official minutes can be prepared. Itemize significant proceedings and decisions. Identify 'action by' appropriate parties. Reproduce and distribute copies of minutes within three days after each meeting and transmit to meeting participants and affected parties not in attendance.
 - .4 Standard Templates for Minutes of Meeting will be distributed for the Contractors use at the Pre-Construction Meeting.
 - .5 Contractor to provide Project Contact List within 4 days following the Pre-Construction Meeting. Standard templates for the Contact List will be distributed for the Contractors use at the Pre-Construction Meeting.
- 5.3 Project Site Administration:
- .1 Contractor to maintain at the Jobsite - 1 - 8.5" x 11" Binder containing the following:
 - .1 Contract Documents.
 - .2 Building Permit & all other required permits
 - .3 Building Permit Review Documents
 - .4 Addenda.
 - .5 Reviewed shop drawings.
 - .6 Change Orders and other Contract modifications.
 - .7 Field test and inspection reports.
 - .8 Approved schedules.
 - .9 MSDS Sheets and relevant Product Data.
 - .10 Contact List.
 - .11 Notice of Project.
 - .12 Rform correspondence.
 - .13 All additional items requested as per the Owners Pre-Construction List.
- 5.4 Submittal Schedule:
- .1 Provide schedule for submittal of all Shop Drawings, Product Data and Samples at the Project Pre-Construction Meeting.
 - .2 Provide complete list of all manufactured products to be used in the course of the Work, including those amended by addenda.
- 5.5 Additional Documents:
- .1 Consultant may issue additional documents in the form of drawings, specifications, schedules, or written instructions to assist proper execution of the Work. These documents shall take the form of either a Supplemental Instruction or Change Order.

- 5.6 Submittals:
- .1 Submit to Consultant, all items specified for review, at least 10 days before reviewed submissions will be needed, and in orderly sequence so as to not cause delay in the Work. Do not proceed with work affected by the submittal until review is complete.
 - .2 Review all submittals prior to submission to the Consultant. Submittals not stamped, signed, and dated will be returned without review.
 - .3 Verify field measurements and affected adjacent work are coordinated. Contractor's responsibility for errors and omissions in submission, or deviations from requirements of Contract Documents, is not relieved by Consultant's review of submittals.
 - .4 A 2 week standard timeframe is assumed for the preparation and submission of Sample, Shop Drawings, and Product Data. All Samples, Shop Drawings and Product Data which do not meet this criteria must be identified at the project Pre-Construction Meeting.
- 5.7 Submission Requirements:
- .1 Submit digital copies of all submittals. Submittals by Email, or as copies of an email transmissions are not acceptable and will not be reviewed. Shop drawings and product data sheets not submitted in the scale type of the contract documents (ie. metric for metric drawings) will not be reviewed.
 - .2 Accompany submissions with transmittal letter containing date, Project title and number, Contractor's name and address, drawing/page numbers of each shop drawing or data sheet, identification (ie. "structural steel shop dwgs."), and number of copies submitted.
- 5.8 Return of Submissions:
- .1 If no errors are discovered or only minor corrections are made, one copy of the submission will be returned. If shop drawings or data sheets are rejected, noted copy will be returned and resubmission of corrected shop drawings or data sheets through the same procedure indicated above, shall be made.
- 5.9 Distribution of Submittals after Review:
- .1 Distribute copies of shop drawings and product data which carry Consultant's stamp to all affected parties.
- 5.10 Product Data Sheets
- .1 Manufacturer's standard schematics, catalogue sheets, diagrams, schedules, performance charts, illustrations and other descriptive data are acceptable in lieu of shop drawings, where specified.

- .2 Submit product data sheets or brochures requested in specification Sections, and as the Consultant may reasonably request where shop drawings will not be prepared due to standardized manufacture of product.
 - .3 Submit copies of all WHMIS Data Sheets.
- 5.11 Samples:
- .1 Submit duplicate samples for review, in sizes requested in respective specification sections. Label samples as to origin and intended use in the Work. Where colour, pattern or texture is criteria, submit full range of samples.
 - .2 Deliver samples prepaid to Consultant's office.
 - .3 Reviewed samples will become standards of work and material against which installed work will be checked on project.
- 6 **CONTRACT ADMINISTRATION**
- 6.1 The Contract Administration office functions performed by the Consultant will generally be done through the web based contract administration software "Rform" by Re Form Technologies Ltd. (www.rform.ca).
 - 6.2 Contractor will be required to participate with the balance of the project team by using Rform for the duration of the project. Rform is a free service to the Contractor and does not require the Contractor to pay any setup or usage fees.
 - 6.3 Contractor will be provided with instructions on the access and operation of Rform in the event they are not familiar with it's function or operation. The Contractor's staff involved in the project will be provided with access to Rform at no cost to the Contractor.
 - 6.4 Suppliers and Subcontractors will not be provided with access to Rform. The distribution of information issued by the Consultant, and coordination of that information, remains the responsibility of the Contractor.
 - 6.5 Rform will be used for issuing electronic project related documents, including Requests for Information, Supplemental Instructions, Proposed Change Orders, Change Orders, Change Directives, Progress Claims, Certificates of Payment, Submittal Reviews, and other forms as may be required. At the discretion of the Consultant, Rform may also be used for the distribution and filing of other project related documents, including but not limited to Field Review Reports, Test Reports, Meeting Minutes, and so on. Rform will also provides automatically generated logs of documents issued within Rform.
 - 6.6 Contractor will be required to print hard copies of all project related documents issued through Rform, and to maintain files of those documents on site at all times.

6.7 Notwithstanding that Rform does not require signatures for the issuance and approval of documents, adjustments to the Contract Price and Contract Time in a Change Order shall only be deemed to be agreed to by the Owner and Contractor when executed by hand.

7 CONSTRUCTION PHOTOGRAPHS

.1 General:

- .1 Provide construction photographs in accordance with procedures and submission requirements specified in this section.
- .2 Photographs shall be taken using a digital camera.
- .3 Photo Print Size: minimum 100 x 150mm.

.2 Progress Photographs:

- .1 Provide construction photographs, documenting progress of the Work. Submit one digital set, with each monthly progress draw.
- .2 Submit progress photographs with each monthly progress draw, documenting the following milestones;
- .3 Completion of excavation and pouring of footings,
- .4 Completion of foundations prior to backfilling,
- .5 Completion of structural frame,
- .6 Completion of rough-in of mechanical and electrical services before concealment.
- .7 Completion of building veneers.
- .8 Completion of each interior finish material.
- .9 Orientation of Photographs: provide photos from at least 2 general viewpoints, as well as specific views as required by milestones specified above, and as determined by Consultant prior to first Progress Draw.
- .10 Identification: legible identification on 20 x 50mm white label on top left corner of all photographs indicating the following:
 - .1 Project name and number,
 - .2 Orientation,
 - .3 Date of exposure.

.3 Final Photographs:

- .1 In addition to progress photographs, provide 1 digital set of images, of final photographs of the completed project.
- .2 Orientation of Photographs: provide final photos as follows:
 - .1 General viewpoints as defined above.
 - .2 Views of all exterior elevations.
 - .3 Views of site showing paved and landscaped surfaces.
 - .4 Interior views of all spaces.
 - .5 Specific views as determined by Consultant .
- .3 Identification: legible identification on 20 x 50mm white label on top left corner of all photographs indicating the following:
 - .1 Project name and number.
 - .2 Orientation.

.3 Date of exposure.

8 **QUALITY CONTROL**

8.1 Independent Inspection and Testing:

.1 Independent Inspection and Testing Consultants will be engaged by the Owner for the purpose of inspecting and/or testing individual portions of the Work. The initial cost of such services will be borne by the Owner, as allocated under Allowances.

8.2 Reports:

- .1 Submit one digital copy of inspection and test reports to the Consultant.
- .2 Provide copies to Subcontractor of work being inspected or tested, manufacturer or fabricator of material being inspected or tested. Submit one copy of inspection and test reports to the Building Official having jurisdiction, where required by that official.
- .3 The cost of tests 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 authorized as recoverable.

8.3 Inspection and Testing - General:

- .1 Furnish test results and mix designs as may be requested.
- .2 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 authorized as recoverable.

8.4 Inspection and Testing - Procedures:

- .1 Notify the appropriate agency 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 cause delay in the Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store, cure and inspect test samples.

8.5 Quality Of The Work:

- .1 Quality of the Work shall be first class, executed by workers 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 Do not employ any unfit person or anyone unskilled in their required duties. The Consultant reserves the right to require the dismissal from the site, of workers deemed incompetent, careless, insubordinate or otherwise objectionable.

8.6 Defective Materials and Work:

- .1 Where evidence exists that defective work has occurred, or that work has been carried out incorporating defective products, the Consultant may have independent tests, inspections, or surveys performed in order to determine if work is defective.
- .2 Tests, inspections, or surveys carried out under these circumstances will be made at the Contractor's expense in the event of defective work, or at the Owner's expense where work is in conformance. This does not include re-testing of soil compaction during placement, where evidence exists of non-conformance with the Contract documents, but rather only if re-testing is called for after completion of compaction.

9 **TEMPORARY FACILITIES AND CONSTRUCTION CONTROLS**

- 9.1 Provide temporary utilities, facilities and controls in order to execute the work expeditiously. Remove from site all such work after use.

9.2 Vehicular Access & Parking:

- .1 If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractor's use of roads. Maintenance shall include regular snow removal, and regular power washing to remove mud and dirt.
- .2 Where site access for construction vehicles necessitates use of public roads, remove mud and dirt from such roads where contaminated by construction vehicles.
- .3 Traffic Control: Provide and maintain flagpersons, traffic signals, barricades and flares, lights, or lanterns as required to perform the work and protect the public.
- .4 Provide and maintain adequate access to project site.
- .5 Build and maintain temporary access roads where indicated or required, and provide snow removal during period of work.
- .6 If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractor's use of roads. Maintenance shall include regular snow removal if not provided under separate contract, and regular power washing to remove mud and dirt.
- .7 Where site access for construction vehicles necessitates use of public roads, remove mud and dirt from such roads where contaminated by construction vehicles.

- .8 Traffic Control: Provide and maintain flag persons, traffic signals, barricades and flares, lights, or lanterns as required to perform the work and protect the public.
- 9.3 Construction Parking:
 - .1 Parking for construction equipment vehicles will be limited to the site or immediate areas of work.
 - .2 Parking for Contractors' and Subcontractors' personal vehicles will not be permitted on site unless authorized by the Owner and Building Services Manager.
- 9.4 Temporary Utilities:
 - .1 Temporary Electricity and Lighting:
 - .1 Connect to existing power supply in accordance with Canadian Electrical code.
 - .2 Install temporary facilities for power such as pole line and underground cables to approval of local power supply authority.
 - .3 Electrical power and lighting systems installed under this contract can be used for construction requirements provided that guarantees are not affected thereby. Make good damage. Replace lamps which have been used more than a period of 3 months.
 - .4 Provide temporary lighting in all areas of construction, to the minimum requirements of the Occupational Health and Safety Act, and minimum requirements specified herein.
 - .2 Temporary Water Supply:
 - .1 Water supply is available in existing building and will be provided for construction usage at no cost.
 - .2 Permanent water supply system installed under this contract can be used for construction requirements provided that guarantees are not affected thereby. Make good damage.
 - .3 Temporary Heating and Ventilating:
 - .1 Provide and maintain all temporary heat and ventilation necessary during construction, including cost of installation, fuel, operation, attendance and maintenance. Use of direct-fired heaters discharging waste products into work areas will not be permitted unless prior approval is given by Consultant.
 - .2 Prevent hazardous accumulation 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 Maintain strict supervision or operation of temporary heating and ventilating equipment.

- .7 Conform to the requirements of CAN/CSA Z317.2-01 – Special Requirements for Heating Ventilating and Air Conditioning (HVAC) Systems in Health Care Facilities.

- .4 The permanent HVAC systems of the building, or portions thereof, may not be used for construction purposes.

- 9.5 Construction Facilities:
 - .1 Temporary Telephone and Facsimile: Provide and pay for temporary telephone. Cellular telephones are acceptable.

 - .2 Equipment, Tools and Materials Storage:
 - .1 On site storage of materials and equipment is not permitted unless authorized by the Building Services Manager. Provide adequate weathertight enclosures with raised floors, for storage of materials, tools, and equipment which are subject to damage by weather.
 - .2 Temporary enclosures required by subtrades as workshops shall be provided by those trades.
 - .3 Confine the Work and the operations of employees to limits indicated by the Contract Documents. Where on-site storage is authorized, do not unreasonably encumber the premises with Products.
 - .4 Do not load or permit to be loaded any part of the Work with a weight or force that will endanger the Work.

 - .3 Site Storage and Overloading:
 - .1 Confine the Work and the operations of employees to limits indicated by the Contract Documents. Do not unreasonably encumber the premises with products.
 - .2 Do not load or permit to be loaded any part of the Work with a weight or force that will endanger the Work.

 - .4 Sanitary Facilities:
 - .1 The Owner's existing facilities may not be used. Provide sanitary facilities for work force in accordance with governing regulations and ordinances. Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition. Where portable toilet facilities are provided, empty and sanitize such facilities on a weekly basis, or more frequently if required.
 - .2 Owner's existing facilities may not be used, unless designated by the Building Services Manager. Use only those facilities when so designated. Maintain designated facilities in a clean and sanitary condition while in use by construction workers.
 - .3 Permanent new facilities may not be used.

- 9.6 Construction Safety:
- .1 Provide applicable spare safety equipment such as helmets, safety glasses, and harnesses, and enforce their use by Consultants, the Owner, their representatives and any authorized visitors to the site.
 - .2 Provide and maintain fences, gates and locks, covered walkways, guard rails, barriers, night lights, and appropriate warning signage as required for the protection of the public, and of public and private property; as required by the General Conditions of the Contract, the Occupational Health and Safety Act and Regulations for Construction Projects, and by all authorities having jurisdiction. Erect and maintain sturdy railings around shafts, and the like, to protect workmen and the public from injury.
 - .3 Contractors are to provide relevant certifications for all workers and sub-contractors at the pre-construction meeting. Copies shall be kept onsite in the Project Binder.
- 9.7 Temporary Barriers & Enclosures:
- .1 Dust Screens:
 - .1 Provide dust tight screens or partitions to localize dust generating activities, and for the protection of workers, finished areas of Work and the public.
 - .2 Dust screens shall consist of, as a minimum, 0.15 mm thick polyethylene sheets secured to appropriate framing and sealed at all joints and at perimeter to prevent migration of dust.
 - .3 Maintain and relocate protection until such work is complete.
 - .2 Temporary Partitions:
 - .1 Provide temporary partitions to separate the work areas from occupied resident areas.
 - .2 Temporary partitions shall consist of 92mm steel studs with 16mm Type X gypsum board both sides. Partitions shall be constructed as fire separations having a 1 hour fire resistance rating. Provide 89mm thick sound attenuation batt insulation.
 - .3 Provide lockable fire-rated hollow metal doors and frames for access to work areas by workers, and to prevent access by resident or unauthorized personnel.
 - .4 Provide temporary windows.
 - .3 Contractor to provide security until dust screens and temporary partitions are erected.
 - .4 Dust Screen and Temporary partitions must be erected to the satisfaction of the Building Services Manager and the Consultant. A Dust Control/Temporary Partition Layout Proposal, must be submitted for review by the Building Services Manager and Consultant prior to the start of the Work.

- .5 Security:
 - .1 Where security of an existing building has been reduced by the Work, provide temporary means to maintain security. Provide and pay for security service to patrol the site if building cannot be otherwise secured.
 - .2 Adhere to the Owner's policies for security and access to long term care centre.

- .6 Building Access:
 - .1 Access existing building only at points designated by the Owner.
 - .2 When designated by the Owner, elevators assigned for Contractor's use may be used for moving workers and materials within building. Protect walls of elevators to approval of Consultant before use. Accept liability for damage, safety of equipment and overloading of existing equipment.

- .7 Site Signs and Notices:
 - .1 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed by Consultant.
 - .2 No other signs or advertisements of any description except notices regarding safety and instruction, shall be put up around the building, or site, without the approval of the Consultant.
 - .3 Provide and install all temporary signage as required to direct interior and exterior traffic flows.

10 **FIRE SAFETY**

10.1 Fire Fighting Equipment:

- .1 Provide and maintain in working order, ULC labelled, 9kg 4A 60BC type fire extinguishers, and locate in prominent positions to approval of authorities having jurisdiction.

10.2 Fire Department Access:

- .1 Construction activities must not obstruct access routes designated for fire department equipment. If necessary that existing access be obstructed or deleted, alternative access, acceptable to the fire department, must be provided prior to commencement of construction, in accordance with Ontario Building Code location and design criteria for required access routes.

10.3 Control of Combustible Materials:

- .1 The stockpiling of construction materials adjacent to the existing building must be carefully controlled in accordance with the Ontario Fire Code. Materials stored, and their proximity to equipment used in construction, may create a fire hazard. Control of combustibles on a construction site is regulated under the Occupational Health and Safety Act.

10.4 Hot Work And Red Tag Permit Training:

- .1 All Contractors including Sub-Contractors who are involved in this Project shall submit written certificates prior to commencement of work confirming that all staff performing work has successfully completed "Managing Impairments Using FM Global's Red Tag Permit System" and "Managing Hot Work Using FM Global's Hot Work Permit System".
- .2 In order to successfully complete the training, a grade of 80% is required. The contractor and sub-contractor's staff must be re-certified every three years.
- .3 The free online training session can be accessed through <http://training.fmglobal.com>. Each session takes less than one hour to complete and can be accessed 24 hour a day, seven days a week from any computer connected to the Internet.
- .4 Contractor to coordinate with the City's Project Manager to obtain the login credentials. Authorization will be obtained by the Project Manager by sending an e-mail to onlinetraining@fmglobal.com with the name, company name and e-mail address of the person(s) requiring authorization. Please note that 24 hours is required to allow for confirmation of contractor authorization. Contractor is responsible for coordinating registration of the courses with the City's Project Manager.

11 **PRODUCT REQUIREMENTS**

11.1 Product Options:

- .1 Provide products specified under individual specification sections. Where Specification lists two or more products, or two or more manufacturers of the same product, the Contractor may select one of the listed products or manufacturers. Confirm selection of products and manufacturers when requested by the Consultant.
- .2 When only one product or manufacturer is listed in the specifications, it is intended that only that product or manufacturer is acceptable.

11.2 Availability:

- .1 Immediately upon signing Contract, review Product delivery requirements, and identify lead times for supply of all Products. If lead times in supply of Products may affect the Construction Schedule, notify the Consultant in order that appropriate action may be authorized in ample time to prevent delay in performance of the Work.
- .2 In the event of failure to notify the Consultant at commencement of Work, and should it appear that Work may be delayed for such reason, the Consultant reserves the right to substitute more readily available products of similar character, at no increase in Contract Price.

11.3 Reference Standards:

- .1 Within the specifications, reference standards are identified. Conform to these standards, in whole or part, as specifically requested.
- .2 If there is question as to whether any product or system is in conformance with applicable standards, the Consultant reserves the right to have such products or systems tested to prove or disprove conformance. The cost for such testing will be born by the Contractor.

11.4 Product Transportation & Delivery:

- .1 Transportation and delivery costs of Products required in the performance of the Work, are included in the Contract Price.
- .2 Products must be appropriately crated, skidded, boxed, shrink-wrapped, or otherwise packaged to protect such products from damage during shipment. Products which arrive at the site in a damaged condition must be rejected and returned to the supplier/manufacturer for immediate replacement.

11.5 Product 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 instructions.
- .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 sheet materials and lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .5 Remove and replace damaged Products at own expense and to the satisfaction of the Consultant.

11.6 Manufacturer's Instructions:

- .1 Unless otherwise indicated in the specifications, install or erect Products in accordance with manufacturer's printed instructions. Do not rely on labels or enclosures provided with Products. Obtain written instructions directly from manufacturers.
- .2 Notify Consultant in writing, of conflicts between the specifications and manufacturer's instructions, so that Consultant may establish correct course of action.

- .3 Improper installation or erection of Products, due to failure in complying with these requirements, authorizes the Consultant to require removal, replacement where necessary, and re-installation at no increase in Contract Price.

11.7 Fastenings:

- .1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.
- .2 Space anchors within limits of load limit or shear capacity and ensure that they provide positive permanent anchorage. Wood or any other organic material plugs are not acceptable.
- .3 Keep exposed fastenings to a minimum, space evenly and install neatly.
- .4 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

11.8 Quality Of Materials:

- .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 (compatible with specifications) for the purpose intended. If requested, furnish evidence as to type, source and quality of Products provided.
- .2 Defective products, whenever identified prior to the completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve 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 Consultant may request additional testing based upon the requirements of the Contract Documents, to confirm acceptability of products or materials.
- .4 Unless otherwise indicated in the specifications, maintain uniformity of manufacture for any particular or like item throughout the building.
- .5 Permanent labels, trademarks and nameplates on Products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

11.9 Defective Materials and Work:

- .1 Where evidence exists that defective work has occurred, or that work has been carried out incorporating defective products, the Consultant may have independent tests, inspections, or surveys performed in order to determine if work is defective.

- .2 Tests, inspections, or surveys carried out under these circumstances will be made at the Contractor's expense in the event of defective work, or at the Owner's expense where work is in conformance. Where tests incorporate a number of samples, payment will be assessed, by the Consultant, based on the ratio of conforming to non-conforming results. This does not include re-testing of soil compaction during placement, where evidence exists of non-conformance with the Contract documents, but rather only if re-testing is called for after completion of compaction.

11.10 Warranties & Guarantees:

- .1 Warranties and Guarantees shall commence at Date of Substantial Performance of the Contract as certified by the Consultant.
- .2 Warranties and Guarantees shall be original copies, printed on company letterhead, or on a standard company warranty certificate, bearing the name of the company.
- .3 Warranties and Guarantees shall indicate:
 - .1 Name of the Principal (the Manufacturer/Subcontractor),
 - .2 Name of the Obligee (the Owner),
 - .3 Name and address of Project,
 - .4 Commencement date (Date of Substantial Performance),
 - .5 Duration of warranty or guarantee,
 - .6 Clear statement of what is included, and what if any exclusions there are, and
 - .7 Signature of Principal's representative having signing authority.

12 **EXECUTION REQUIREMENTS**

12.1 Preparation:

- .1 Field Engineering:
 - .1 Locate, confirm and protect control points prior to starting the Work. Preserve permanent reference points during construction.
 - .2 Establish reference lines and elevations. Locate and lay out by instrumentation.
- .2 Survey Requirements:
 - .1 A certified land survey prepared by a Registered Ontario Land Surveyor (OLSA member), acceptable to Owner, will be required under the following circumstances:
 - .1 Where the Work is an entirely new building,
 - .2 Where the Work is an addition to be constructed up to site setback line(s), as legislated by municipality, or
 - .3 Where the Work is a long term care centre or addition thereto.
 - .2 Establish two new permanent bench marks on site, referenced to existing bench mark(s) by survey control points. Record locations, with horizontal and vertical data for inclusion in Operations and Maintenance Manual.

- .3 Records:
 - .1 Maintain a complete, accurate log of control points and survey work as work progresses.
 - .2 On completion of foundations and major site improvements, prepare certified survey showing dimensions, locations, angles and elevations of foundation work.

- 12.2 Cutting and Patching:
 - .1 Submit a written request in advance, for approval of cutting or alteration which affects:
 - .1 Structural integrity of any element of Project.
 - .2 Integrity of weather-exposed or moisture-resistant elements.
 - .3 Efficiency, maintenance, or safety of any operational element.
 - .4 Visual qualities of sight-exposed elements.
 - .5 Work of Owner or separate contractor.
 - .2 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
 - .3 After uncovering, inspect conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.
 - .4 Perform cutting, fitting and patching, including excavation and fill, to complete the Work. Perform work to avoid damage to other work.
 - .5 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.
 - .6 Cut rigid materials using power saw or core drill. Pneumatic or impact tools not allowed.
 - .7 Fit work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces. At penetration of fire-rated wall, ceiling, or floor construction, completely seal voids with fire stopping material, full thickness of construction element. Refer to 'Firestops and Smoke Seals Section' where provided. Maintain Fire Separation to code as required at no additional cost to the Owner.
 - .8 Refinish surfaces to match adjacent finishes; for continuous surfaces refinish to nearest intersection; for an assembly, refinish entire unit to the satisfaction of the Consultant at no additional cost to the Owner.
 - .9 Provide all openings greater than 200mm in non-structural elements of work for penetrations of mechanical and electrical work. Divisions 21, 22, 23 and 26 shall provided all sleeves and locations for sleeves. The cost of all cutting and patching required by Divisions 21, 22, 23 and 26 shall be paid for by those trades.

- .10 Ensure that all cutting and patching work, including that paid for under Divisions 21, 22, 23 and 26, is properly performed by the respective trades skilled in that line of work. Restore work with new products in accordance with Contract Documents.

12.3 Location Of Equipment and Fixtures:

- .1 Location of mechanical and electrical equipment, fixtures and devices indicated or specified, are to be considered as approximate. Final location of such items will be determined on site, based on integration with structural and architectural elements, and as required by coordination with other trades. In the event of a conflict, final determination of location of these items rests with the Consultant at no additional cost to the Owner.
- .2 Prepare and submit for review by the Consultant, interference field drawings, to indicate relative position of various services and equipment, at the following locations as a minimum:
 - .1 Under all rooftop mechanical units.
 - .2 At locations of all major ductwork, piping, and conduit crossovers.
 - .3 Where ductwork passes under major structural elements.
- .3 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.
- .4 Request a review of items by Consultant once rough-in is underway, prior to final installation, and obtain approval for actual locations.

12.4 Concealment:

- .1 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas, except where indicated otherwise.

12.5 Lighting Fixtures at Suspended Ceilings

- .1 Ensure that secure support is provided for lighting fixtures by suspended ceilings, or by separate hangers, or by both.
- .2 Coordinate the ceiling system and lighting fixture installations to provide adequate support.
- .3 Submit affidavits with acceptable design information confirming that the installation of the suspended ceiling system and/or separate fixture hangers will provide adequate support for the lighting fixtures without exceeding specified deflection tolerances for the ceiling system.
- .4 Conform to current requirements of the Electrical Safety Authority (ESA).

- 12.6 Existing Services:
- .1 Where work involves the interruption of, or connection to existing services, carry out such work as directed by governing authorities, with minimum of disturbance to pedestrian and vehicular traffic.
 - .2 All interruption of shut down of Building Systems must be fully coordinated with the Consultant and Building Services Manager.
 - .3 Before commencing work, establish location and extent of service lines in area of work and notify Consultant of findings.
 - .4 Submit schedule to, and obtain approval from Consultant for any shutdown or closure of active service or facility. Adhere to approved schedule and provide notice to affected parties.
 - .5 Provide adequate bridging over trenches which cross sidewalks or roads to permit normal traffic.
 - .6 Where unknown services are encountered, immediately advise Consultant and confirm findings in writing.
 - .7 Remove abandoned service lines to distance of 1200mm from foundations. Cap or otherwise seal lines at cut-off points as directed by Consultant.
 - .8 Record locations of maintained, re-routed and abandoned service lines.
- 12.7 Alterations, or Additions to Existing Building:
- .1 Execute work with least possible interference or disturbance to occupants, public and normal use of premises. Arrange with Owner to facilitate execution of work.
 - .2 Interruptions to building services shall require a minimum of 72 hours written notice to the Owner. Obtain Owner's approval before interrupting any building service.
- 13 **CLEANING & WASTE MANAGEMENT**
- 13.1 Conduct cleaning and disposal operations to comply with local ordinances and environmental protection legislation.
 - 13.2 Store volatile wastes in covered metal containers, and remove from premises at end of each working day.
 - 13.3 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
 - 13.4 No Mixing of Materials in open areas used by Building Occupants.

- 13.5 Area for Mixing of Materials to be determined by the Consultant and Building Services manager
- 13.6 Failure to maintain site cleanliness to the satisfaction of the Building Services Manager and the Consultants will result in cleaning performed by the owner and charged to the Contractor. (for both general cleaning and final cleaning).
- 13.7 All cleaning materials used(for both general cleaning and final cleaning) to be reviewed and approved for use by the Consultant and Building Services Manager.
- 13.8 Cleaning During Construction:
- .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.
 - .2 Remove waste material and debris from the work areas and deposit in waste container at the end of each working day.
 - .3 Vacuum clean interior areas prior to start of finishing work. Maintain areas free of dust and other contaminants during finishing operations.
 - .4 Individual Subcontractors are responsible for the daily clean-up and removal of debris related to, or generated by, their own work. The overall responsibility for project cleanliness rests with the Contractor.
- 13.9 Waste Management:
- .1 Audit, separate and dispose of construction waste generated by new construction or by demolition of existing structures in whole or in part, in accordance with Ontario Regulations 102/94 and 103/94 made under the Environmental Protection Act.
 - .2 Fires, and burning of rubbish or waste on site is prohibited.
 - .3 Burying of rubbish or waste materials, except as specified herein, is prohibited.
 - .4 Disposal of waste or volatile materials such as mineral spirits, oil, gasoline or paint thinner into ground, waterways, or sewer systems is prohibited.
 - .5 Empty waste containers on a regular basis to prevent contamination of site and adjacent properties by wind-blown dust or debris.
- 13.10 Final Cleaning Operations:
- .1 Immediately following Date of Substantial Performance, and prior to Owner occupancy of the building or portion of the building affected by the Work, conduct full and complete final cleaning operations.

- .2 Final cleaning operations shall be performed by an experienced professional cleaning company, possessing equipment and personnel sufficient to perform full building cleaning operations.
- .3 Remove all surplus products, tools, construction machinery and equipment not required for the performance of remaining work, and thereafter remove any remaining materials, equipment, waste and debris.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .6 Cleaning operations shall include the removal of all stains, spots, scuff marks, dirt, dust, remaining labels, adhesives or other surface imperfections.
- .7 Remove all paint spots or overspray from all affected surfaces.
- .8 Vacuum, clean and dust behind grilles, louvres and screens.
- .9 Broom clean and spray wash all exterior paved surfaces.
- .10 Remove dirt and other disfiguration from exterior surfaces.
- .11 Clean all areaways, drywells, and drainage systems.
- .12 Clean all equipment and fixtures to a sanitary condition, clean or replace filters of mechanical equipment.

14 **PROJECT CLOSE-OUT PROCEDURES**

14.1 Inspection and Declaration:

- .1 Arrange for, conduct and document final inspections, close-out and commissioning at the completion of the Work in accordance with procedures described in the Conditions of the Contract and OAA/OGCA Document 100.

14.2 Substantial Performance:

- .1 Contractor's Inspection:
 - .1 In addition to the requirements outlined in the Conditions of the Contract, the following items shall accompany the Contractor's application for Substantial Performance. These items must be submitted and reviewed and complete in all respects, and all verification certificates and reports having been submitted and approved by the Consultants prior to issuing Substantial Completion:
 - .1 Completed Maintenance Manuals for all disciplines,
 - .2 As-Built Drawings for all disciplines,

- .3 Occupancy Permit (where required by Municipality),
- .4 Air Balance Report (legible technicians worksheets are acceptable),
- .5 Gas fired appliances inspection,
- .6 Plumbing Inspection,
- .7 Domestic Water Quality Test Report,
- .8 Sprinkler dry test verification letter stamped and signed by sprinkler design Engineer,
- .9 Mechanical start-up reports (Boilers, HVAC Units, Chillers, Water Softeners, etc.),
- .10 Fire Alarm verification (include legible technicians worksheets),
- .11 Emergency Lighting verification,
- .12 ESA Certificate,
- .13 Systems operations have been demonstrated to Owner's personnel.
- .2 The Contractor and all Subcontractors shall conduct an inspection of the work, identify deficiencies and defects, and make corrections as required to conform with the Contract Documents. Notify Consultant in writing of satisfactory completion of Contractor's Inspection and that corrections have been made. Request a Consultant's Inspection.
- .2 Consultant's Inspection:
 - .1 The Consultants shall perform an inspection of the Work to assess the validity of the Contractors application, and shall identify in separate lists, unfinished work and deficiencies. Contractor shall correct work accordingly.
- .3 Deficiency Review:
 - .1 Following the issuance of the Certificate of Substantial Performance and prior to the Contractor's application for Final Payment and release of any monies retained as "Finishing Holdback", the Contractor shall continue to complete unfinished work and correct deficiencies. At the request of the Contractor, the Consultants shall conduct up to two general deficiency reviews during this period.
 - .2 The first review will be undertaken only if the Contractor has inspected the Work, and states in writing that the unfinished work noted in their application for Substantial Performance has been completed, and at least 50% of all deficiencies have been corrected.
 - .3 The second review will be undertaken only if the Contractor has inspected the Work, and states in writing that at least 90% of the deficiencies have been corrected.
 - .4 If the Consultants determine during either review that the above noted criteria for progress have not been met, they may terminate the deficiency review.
- .4 Reinspection:
 - .1 Should reinspection by Consultant be required due to failure of work to comply with Contract Documents, the Owner will deduct amount of Consultant's compensation for reinspection services from monies owed to the Contractor.

15 **CLOSE-OUT SUBMITTALS**

15.1 Quality:

- .1 Spare parts, maintenance materials and special tools provided shall be new, not damaged or defective, and of the same quality and manufacture as products provided in the Work.
- .2 If requested, furnish evidence as to type, source and quality of Products provided.
- .3 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.

15.2 Delivery, Storage, and Handling:

- .1 Deliver all materials required as maintenance materials, spare parts or special tools, to the site, include shipping costs, and store as directed.
- .2 Store spare parts, maintenance materials and special tools in a manner to prevent damage, or deterioration.
- .3 Store in original and undamaged containers with manufacturer's seals or labels intact.
- .4 Store materials subject to damage from severe climatic changes in a climate-controlled, weatherproof enclosure.
- .5 Store paints and freezable materials in a moderately heated and ventilated room.

15.3 Maintenance Materials, Spare Parts & Tools:

- .1 Provide spare parts in quantities specified in individual specification sections. Provide identical items to those installed in the Work.
- .2 Provide maintenance materials in quantities specified in individual specification sections. Provide identical items of same manufacturer, dye lot or production run as items in the Work.
- .3 Provide special tools in quantities specified in individual specification sections, and tag items identifying their function and equipment or products to which they are associated.
- .4 Receive and catalogue all items. Check inventory and include approved listings in Operations and Maintenance Manual.
- .5 Obtain receipts for delivered products and submit prior to Substantial Performance.

- 15.4 Operations and Maintenance Manual:
- .1 Prepare Operations and Maintenance Manual during the course of construction and have completed prior to Date of Substantial Performance.
 - .2 Maintain digital copy of the Operation and Maintenance Manual volume(s) for periodic review and comment, as requested by the Consultant during the course of construction.
 - .3 Submit digital copies of the final completed volume(s) and one digital copy as either a PDF or Microsoft Word document with the application for Substantial Performance in accordance with OAA/OGCA Document 100.
 - .4 Provide table of contents and index tab sheets for each volume. Itemize and tabulate contents.
 - .5 Group drawings as to content, and index for quick reference.
 - .6 Each copy of the Operation and Maintenance Manual shall contain, as a minimum, the following information:
 - .1 Project contact list including after hours/emergency contact numbers.
 - .2 All contract documents including tender calls, addendums, contract and change orders.
 - .3 Contact information, including after-hours/emergency contact numbers, for maintenance and repairs.
 - .4 Warranty and guarantee certificates.
 - .5 Equipment start-up and troubleshooting instructions.
 - .6 Equipment schematics & diagrams.
 - .7 Catalogue of all maintenance materials and quantities.
 - .8 Maintenance data.
 - .9 Approved and stamped all shop drawings.
 - .10 Before and after photographs organized such that the before and after photographs of any one are positioned adjacent to each other for easy reference.
- 15.5 Record Drawings:
- .1 Upon attaining Substantial Performance completion of the Work, obtain base CAD drawings, from the Consultant. The electronic files will be in AutoCAD 2007. Update the AutoCad drawings to include all contract changes.
 - .2 Submit electronic files to the Consultant for review. Any subsequent changes found by the Consultant shall remain the responsibility of the Contractor at no charge to the Owner.

END OF SECTION

APPENDIX SA – SUGGESTED ALTERNATIVES

Bidder: _____

The following Suggested Alternatives are **NOT INCLUDED** in the Bid price.

Individual Suggested Alternatives may be discarded or incorporated into the Final Contract Price at the discretion of the Owner.

Provide the appropriate data for comparison showing conformance to specified standards, dimensions, fabrication, colour, quality assurance, warranty, execution etc. as necessary for the Consultant to confirm the Suggested Alternative meets or exceeds the specifications. At the time of this submittal, provide the Consultant with the relevant Architectural details which prove conformance with the design intent and co-ordination with and installation by affected trades.

Suggested Alternative Prices **DO NOT INCLUDE** H.S.T.

Suggested Alternatives identified on this form are for Divisions 1 to Division 26 inclusive. We submit a proposal to substitute for:

_____ specified in Section _____ of the Specifications, the following alternative:

The Suggested Alternative is submitted for the following reason:

We ensure that a comparison has been made of all specified characteristics, that the Suggested Alternative does not alter the intent of the Drawings and Specifications and we hereunder tabulate significant variations which lessen the performance characteristics and quality of materials, increase the weights and / or dimensions, and substitute different materials for those specified.

The effect on the stipulated price is (choose one):

ADDITION (\$ _____) DEDUCTION (\$ _____)

(Submit a separate sheet for each item)

1 General

1.1 **SECTION INCLUDES**

- .1 Labour, Products, equipment and services necessary for demolition and removals Work in accordance with the Contract Documents.
- .2 Work included: Requirements for demolishing, salvaging and removing wholly or in part the various items designated on the drawings or required to be removed or partially removed for the receipt of the Work of this Contract, including not necessarily limited to:
 - .1 Alteration and renovations to existing building.
 - .2 Cutting and removing of walls, floors, ceilings, doors and frames, in the existing buildings as indicated on Drawings.
 - .3 Patching, making good openings and chases in walls, floors, ceilings, including the supply and installation of lintels, channels and finishes.
 - .4 Removal of rubbish, debris, demolished fixtures, fitments and items not scheduled to remain the Owner's property, resulting from the demolition and preparatory work.
 - .5 Remove abandoned services such as conduits, pipes, wiring, ducts, fixtures, equipment, etc. where required for the work or indicated on the drawings.
 - .6 Removal of all mechanical items including plumbing fixtures, services etc. where required for the work or indicated on drawings and or where not required to be relocated.
 - .7 Removal of existing electrical items including fixtures, etc. where required for the work or indicated on the drawings and not required to be relocated.
 - .8 Removal and disposal of existing flooring, existing wall base, and all other related products impacted by the work.
 - .9 Gypsum board repair and replacement as indicated.
 - .10 Dust control during the operations of the work of this Section.
 - .11 Removal shall mean removal from site and safe disposal in a legal manner.

1.2 **REFERENCES**

- .1 CSA S350-M, Code of Practice for Safety in Demolition of Structures.

1.3 **SUBMITTALS**

- .1 Where required by Authorities having jurisdiction, submit a Fire Plan to local fire department for review and approval.
- .2 Submit shop drawings, diagrams and details in accordance with Section 01 00 00.
- .3 30 calendar days prior to start of demolition and removals work, submit for review, drawings, diagrams or details showing sequence of disassembly work and shoring of supporting structures in accordance with authorities having jurisdiction.
- .4 Submit for approval, a plan showing impacts, interruptions and delays to Owners operations.

- .5 Submit Dust Control Plan conforming to requirements of the City of Toronto's Public Health Services.
- .6 Have submissions signed and sealed by Professional Engineer licensed in Province of Ontario.
- .7 Submit to Consultant, details of where rubble, debris and other materials are to be disposed or reused. Include each disposal/reuse site location, operator's name and business address, type of license under which site operates, and criteria used by site to assess suitability of rubble, debris and other materials for disposal.
- .8 Give notice to Utility Authorities controlling services and appurtenances which will be affected by demolition work.

1.4 **QUALITY ASSURANCE**

- .1 Prepare waste audits, waste reduction workplans, source separation programs and recycling programs as required by jurisdictional authorities and update programs and implement such programs as required.
- .2 Perform the work of this section in accordance with the 'Environmental Protection Act' including Ontario Regulation 102 and the 'Environmental Assessment Act' including Ontario Regulation 103.
- .3 Conform to Fire Code, Regulation under the Fire Marshals Act.
- .4 The demolition contractor must engage a registered professional engineer who holds a certificate of authorization and an appropriate level of liability insurance to prepare demolition procedures.
- .5 As part of the contract requirements, the engineer for the demolition contractor should be required to sign the general review commitment required by city building departments.

1.5 **SITE CONDITIONS**

- .1 Interruptions to Owners operations will not be permitted.
- .2 Perform operations, machine and equipment movements, deliveries and removals at time or times that will permit uninterrupted operations in and around structures, including parking, deliveries, and Site access and egress.
- .3 Take over structures to be demolished based on condition on date that Tenders close.

2 Products

2.1 **MATERIALS**

- .1 All materials requiring removal shall become the Contractor's property and shall be removed and disposed of from the site, as the work progresses, unless indicated otherwise.
- .2 Salvaged material: Salvage and stockpile original materials as indicated on site or indicated on drawings. Salvaged materials shall not be chipped, cracked, split, stained or damaged. Store items off of moist surfaces.

3 Execution

3.1 **GENERAL**

- .1 Clean up rubble and debris, resulting from work promptly and dispose at end of day or place in waste disposal bins. Empty bins on regular basis.
- .2 Stockpiling of rubble, debris, and surplus Products on Site will not be permitted.
- .3 Remove, handle and transport Products indicated to be salvaged and stored for future use. Transport Products to storage area(s) designated by Consultant. Perform work to prevent any damage to Products during removal and in storage. Products damaged during removal, will be inspected by Consultant. Consultant will determine extent of damage and accept or refuse Products.
- .4 List and description of items to be removed and stored or reused:
 - .1 Sink.
 - .2 Soap dispenser.
 - .3 Paper towel dispenser.
 - .4 Earplug dispenser.
 - .5 Stainless steel wall shelf.
 - .6 Wall-mounted phone.
 - .7 Wall-mounted clock..
 - .8 Corner guards impacted by replacement of floor base.
- .5 Communicate Dust Control Plan procedures to all appropriate personnel on site and their head offices and due diligence measures to be maintained to control all fugitive emissions.
- .6 Take precautions to guard against movement, settlement or collapse of adjacent services, sidewalks, driveways, or trees. Be liable for such movement, settlement or collapse caused by failure to take necessary precautions. Repair promptly such damage when ordered.

3.2 **EXAMINATION**

- .1 Examine adjacent structures and other installations prior to commencement of demolition and removals Work in accordance with Authorities having Jurisdiction.

3.3 **PRESERVATION OF REFERENCES**

- .1 Record location and designation of survey markers and monuments located within demolition area, prior to removal. Store and restore markers and monuments upon completion of Work or relocate as directed by Consultant.

3.4 **PROTECTION**

- .1 Provide, erect and maintain required hoarding, sidewalk sheds, catch platforms, lights and other protection around Site before commencing work. Maintain such areas free of snow, ice, mud, water and debris. Lighting levels shall be equal to that prior to erection.
- .2 Prevent movement or damage of adjacent parts of existing structure to remain. Supply and install bracing, and shoring as required. Make good damage caused by demolition to acceptance of Consultant.
- .3 Protect adjacent structures and property against damage which might occur from falling debris or other causes. Repair or replace damage caused from work of this Section to acceptance of Consultant.
- .4 Do not interfere with use of adjacent structures and Work areas. Maintain free, safe passage to and from adjacent structures and Work areas.
- .5 Take precautions to support affected structures. If safety of structure being demolished, adjacent structures or services are endangered, cease demolition operations and take necessary action to support endangered item. Immediately inform Consultant. Do not resume demolition until reasons for endangering have been determined and corrected and action taken to prevent further endangering.
- .6 Hang tarpaulins where debris and other materials are lowered. Build in around openings with wood and plywood at locations used for removal of debris and materials.
- .7 Prevent debris from blocking surface drainage system, elevators, mechanical, and electrical systems which are required to remain in operation.
- .8 Pay particular attention to prevention of fire and elimination of fire hazards which would endanger Work or adjacent structures and premises.
- .9 Supply and install adequate protection for materials to be re-used, set on ground and prevent moisture pick-up. Cover stockpiles of materials with tarpaulins.

- .10 Close off access to areas where demolition is proceeding by barricades and post warning signs.
- .11 Supply, install and maintain legal and necessary barricades, guards, railings, lights, warning signs, security personnel and other safety measures, and fully protect persons and property.
- .12 Dust/weather partitions:
 - .1 Prior to demolition work proceeding in existing structures, temporarily enclose Work areas, access and supply and install dustproof and weatherproof partitions. Design partitions to prevent dust and dirt infiltration into adjoining areas, prevent ingress of water, and to resist loads due to wind.
 - .2 Prevent dust, dirt and water from demolition operations entering operational areas.
 - .3 Adjust and relocate partitions as required for various operations of work.
 - .4 Upon completion of work, remove and dispose of partitions from Site.
- .13 Dust protection:
 - .1 Perform dust control procedures in accordance with approved Dust Control Plan and work of this Section.
 - .2 Clean water to be applied to hard and soft surfaces and on open excavation faces on Site daily to eliminate dust.
 - .3 Roadways and sidewalks to be cleaned daily or as required.
 - .4 A designated truck loading area on granular material or existing asphalt to be used to mitigate tracking of potentially contaminated soil and demolition debris off Site. Contaminated loading points to be cleaned or re-established.
 - .5 Loaded vehicles leaving Site to be cleaned of loose soil and debris with power washing or alternative method.
 - .6 Trucks loaded with indigenous soil or demolition debris to be covered by tarps or attached screens.
- .14 Blasting is not permitted.

3.5 **PREPARATION**

- .1 Disconnect and/or re-route electrical data, communication and telephone service lines entering structures to be demolished. Remove abandoned lines as indicated on Contract Drawings. Post warning signs on electrical lines and equipment which is required to remain energized.
- .2 Disconnect and cap designated mechanical services:
 - .1 Natural gas supply lines: As indicated on drawings, to be removed by qualified workers in accordance with gas company instructions.
 - .2 Sewer and water lines: Remove and dispose of as indicated on Contract Drawings.
 - .3 Other underground services: Remove and dispose of as indicated on Contract Drawings.

- .3 Disassemble and remove mechanical equipment, ductwork and piping complete with supports and associated components.
- .4 Do not disrupt active or energized utilities designated to remain undisturbed.
- .5 Perform rodent and vermin control to comply with health regulations.

3.6 **CONCRETE CUTTING AND CORING**

- .1 Prior to cutting or coring any concrete slab, suspended or on grade, or any concrete beam, investigate by telemetrically scanning the element for presence of embedded services (piping, cabling, conduit, etc.), and for locations of reinforcing steel in suspended concrete slabs and beams.
- .2 Acceptable telemetric scanning systems include:
 - .1 X-Ray scanning of suspended slabs and for concrete beams.
 - .2 (Ground-penetrating) radar for slab on grade, for suspended slabs and for concrete beams.
- .3 Magnetic radio scanners not acceptable for telemetric scanning.
- .4 The term x-rays include gamma ray methods, and procedures that use electrically generated x-rays.
- .5 Where x-rays employed:
 - .1 Provide Owner minimum 5 working days advance notice of scanning time in order to provide sufficient advance notice to personal that may be affected by the x-ray work.
 - .2 Conform to Owner's radiation protection requirements prior to start of any x-ray work.
- .6 Provide Owner and Consultant with inspection agency's written report, summarizing investigations and conclusions.
- .7 Obtain Consultant's direction where investigations reveal that cutting or coring required in Contract would cut or damage embedded services, or cut or damage reinforcing steel in suspended concrete slabs or beams.
- .8 Execute cutting and coring to prevent damage to all embedded services. Make good all damage arising from cutting embedded services.
- .9 Execute cutting and coring to prevent damage (cutting in whole or in part) reinforcing steel in suspended concrete slabs with Consultant's prior authorization.
- .10 Make good all damage arising from cutting reinforcing steel in suspended concrete slabs and beams.

3.7 **DEMOLITION**

- .1 Perform demolition with extreme care. Confine effects of demolition to those parts which are to be demolished.
- .2 Perform work and prevent inconvenience to persons outside those parts which are to be demolished.
- .3 Carry out demolition in accordance with the requirements of CSA S350-M.
- .4 Demolish parts of structure to permit remedial work as indicated.
- .5 Do not overload floor or wall with accumulations of material or debris or by other loads.
- .6 Perform work to minimize dusting. Keep work area wetted down with fog sprays to prevent dust and dirt rising. Supply and install temporary water lines and connections that may be required. Upon completion, remove installed temporary water lines. Use covered chutes, water down.
- .7 Do not sell or burn materials on Site.
- .8 Remove existing equipment, services, and obstacles where required for refinishing or making good of existing surfaces, and replace as Work progresses.
- .9 At end of day's work, leave Work in safe condition with no part in danger of toppling or falling.
- .10 Drainage and sewer system protection:
 - .1 Ensure that no dust, debris or slurry enters drainage and sewer system on Site.
 - .2 Remove and dispose of debris and slurry promptly from Site.
 - .3 Comply with City of Toronto Sewer Use By-Law.
- .11 Concrete:
 - .1 Demolish concrete by methods which avoid impact loads on items which are not to be demolished.
 - .2 Where only part or parts of a concrete floor, wall, roof, foundation or other items are to be demolished, use saw cuts to isolate areas which are to be demolished except where existing reinforcing steel is to be left in place. Prior to such isolating, install suitable support to prevent premature movement of area(s) being isolated and undesirable transfer of loads as cutting progresses. If necessary remove area(s) to be demolished by successively isolating small sections.
 - .3 Where reinforcing steel is to be left in place, use saw cuts from surface of concrete around perimeter(s) of area(s) to be demolished, chip concrete without damaging reinforcing steel. Retouch damaged epoxy coating of existing reinforcing steel.

- .12 Steel: Where only part or parts of structure is to be demolished, dismantle and maintain structure stable. Do not place excessive loads on components. Install adequate temporary guys and supports to ensure stability and to prevent excessive loading. Support each component being disconnected from structure, and lower, do not drop, component after it is disconnected.
- .13 Cut openings through existing walls, partitions, and floors. Establish exact location of steel reinforcing in existing concrete slabs or walls before cutting. Be responsible for damage to existing steel reinforcing and be liable for structural failure. Make good surfaces disturbed with materials to match existing.
- 14. Where doors are scheduled to be removed, include removal of door frames and door hardware.
- 15. Remove interior partitions, fittings, fixtures and accessories as indicated on drawings. Partitions and walls shall be removed full height to structure above.
- 16. Remove interior finishes, such as ceiling and floor finishes, where new finishes are indicated on Room Finish Schedule.
 - 1. Removal of existing ceilings shall include complete removal including bulkheads and suspension system.
 - 2. Removal of adhesive applied finishes shall include complete removal to substrate including adhesive. Take adequate care to prevent damage to substrate.
- .17 Remove existing floor finishes, include mortar bed, underlayment or other cleavage membranes, underpad, base, floor moulding and transition strips.
- 18. Demolish all other items indicated or required.

3.8 **DISPOSAL OF MATERIALS**

- .1 Remove from Site, rubble, debris, and other materials resulting from demolition and removals work in accordance with Authorities having Jurisdiction, except where specified or indicated on Contract Drawings to be reused.
- .2 Conform to requirements of municipality's Works Department regarding disposal of waste materials.
- .3 Materials prohibited from municipality waste management facilities shall be removed from Site and dispose of at recycling companies specializing in recyclable materials.

3.9 **RESTORATION**

- .1 Where demolition removed a structure or installation, rough grade and restore area in accordance with Authorities having Jurisdiction.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

.1 Labour, Products, equipment and services necessary for concrete work in accordance with the Contract Documents.

1.2 **REFERENCES**

.1 ASTM C156, Test Method For Water Retention by Concrete Curing Materials.

.2 ASTM C260, Specification For Air-Entraining Admixtures For Concrete.

.3 ASTM C494, Specification For Chemical Admixtures For Concrete.

.4 CAN/CSA A23.1/A23.2-M, Concrete Materials and Methods of Concrete Construction/Methods of Tests For Concrete.

.5 CAN/CSA A3000, Cementitious Materials Compendium.

.6 CSA G30.15-M, Welded Deformed Steel Wire Fabric for Concrete Reinforcement.

.7 CAN/CSA G30.18-M, Billet-Steel Bars for Concrete Reinforcement.

.8 CSA O121-M, Douglas Fir Plywood.

.9 CAN/CSA S269.1, Falsework for Construction Purposes.

.10 CAN/CSA S269.3-M, Concrete Formwork.

1.3 **DESIGN REQUIREMENTS**

.1 Design formwork, reinforcing, and concrete in accordance with CAN/CSA A23.1/A23.2-M, CAN/CSA S269.3-M, and to withstand live, dead, lateral, seismic loads, and imposed loads.

.2 Concrete: 32 Mpa unless otherwise indicated on drawings. Exterior concrete to have 5-7% entrained air.

.3 Design concrete so that material will not segregate and excessive bleeding will not occur.

1.4 **QUALITY ASSURANCE**

.1 Inspection and testing:

.1 Materials: CAN/CSA A23.1/A23.2-M; Inspect and test for conformance to requirements of this Standard and to Specifications.

.2 Tests will be made in accordance with CAN/CSA A23.2-M.

.3 Remove defective materials and completed Work which do not conform to the Contract Documents.

.2 Certificates:

.1 Submit certification that plant, equipment, and materials to be used in reinforced concrete work comply with requirements of CAN/CSA A23.1/A23.2-M.

.2 Ready mix concrete supplier: Member in good standing of Ready Mix Concrete Association of Ontario (RMCAO). Batching plant facilities are required to maintain RMCAO special seal of quality.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Deliver and store materials on Site in accordance with CAN/CSA A23.1/A23.2-M.

1.6 SITE CONDITIONS

.1 Conform to CAN/CSA A23.1/A23.2-M.

2 Products

2.1 MATERIALS

.1 Falsework materials: CSA S269.1.

.2 Forms: Plywood to CSA O121-M, G1S; Douglas Fir plywood, sheets as large as practical, minimum 19 mm thick, seven ply, exterior grade, waterproof glue, edges sealed with oil based sealer.

.3 Form release agent: Chemically active, non-staining, VOC compliant, release agents containing compounds that react with free lime present in concrete forming water insoluble soaps, preventing concrete from sticking to forms.

.4 Reinforcing steel: CAN/CSA G30.18-M; Billet-steel bars, deformed unless indicated otherwise, Grade 400R.

.5 Chairs, bolsters, supports, spacers: CAN/CSA A23.1-M with sufficient strength to rigidly support weight of reinforcement and construction loads. Manufactured by NCA/Acrow - Richmond or Dayton Superior.

.6 Cement: CAN/CSA A3000; Portland, Type GU.

.7 Coarse and fine aggregate: CAN/CSA A23.1/A23.2-M.

.8 Water: CAN/CSA A23.1/A23.2-M.

.9 Water reducing admixture: ASTM C494, Type A.

- .10 Set retarding admixture: ASTM C494, Type D.
- .11 Set accelerating admixture: ASTM C494, Type C.
- .12 Air entraining admixture: CAN/CSA A23.1/A23.2-M and ASTM C260.
- .13 Curing compound: ASTM C309, Type 2, Class B; Clear for interior concrete. White pigmented for exterior work.

2.2 CONCRETE MIXES

- .1 Provide minimum 32 Mpa concrete unless otherwise indicated on the drawings and in accordance with the Contract Documents.
- .2 Acceptance of any concrete mix proportion or material, does not preclude its future rejection if it is subsequently found to lack uniformity, or if it fails to conform to requirements specified, or if its field performance is found to be unacceptable.
- .3 Mix concrete and concrete proportions in accordance with CAN/CSA A23.1/A23.2-M.
- .4 When combinations of Portland cement and supplementary cementing materials are used, prove to acceptance of Consultant that concrete will withstand exposure conditions outlined in Contract Documents

2.3 ADMIXTURES

- .1 Use admixtures for concrete from single manufacturer, unless otherwise acceptable to Consultant.
- .2 Have manufacturer certify that admixtures are compatible.
- .3 Add admixtures to concrete mix in accordance with manufacturer's recommendations.
- .4 Except as specified otherwise, comply with requirements of CAN/CSA A23.1/A23.2-M.
- .5 Use of calcium chloride or additional admixtures, other than those specified, is not acceptable.

3 Execution

3.1 EXAMINATION

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.

3.2 **GENERAL**

- .1 Give Consultant at least 2 working days notice prior to placement of concrete to permit a review of placement of formwork, reinforcing steel, and associated items embedded in concrete for conformance to reviewed shop drawings and Contract Documents.
- .2 Do not place concrete on surfaces which contain frost, water or debris.
- .3 Ensure that reinforcement and associated items embedded in concrete are not disturbed during placement of concrete.
- .4 Ensure concrete cover over reinforcing steel is as indicated on Contract Drawings.

3.3 **FORMWORK**

- .1 Construct falsework in accordance with CSA S269.1.
- .2 Construct formwork in accordance with CAN/CSA S269.3-M to produce finished concrete conforming to shape, dimensions, locations and elevations indicated with tolerances specified herein.
- .3 Take particular care in forming corners and openings. Ensure formwork is tight and braced so no movement occurs.
- .4 Align form joints and make watertight. Keep form joints to a minimum. Ensure no visible defects appear on exposed finished Work.
- .5 Apply release agent by spray in accordance with manufacturer's recommendations. Ensure form surfaces receive a uniform coating.

3.4 **REINFORCING PLACING**

- .1 Place reinforcing steel as shown on reviewed shop drawings and in accordance with CAN/CSA A23.1-M. Make bars as long as possible.
- .2 Make splices in locations shown on Drawings. Lap lengths in accordance with CSA A23.3 unless otherwise shown.
- .3 Lap ends and sides of wire fabric not less than 150 mm.

3.5 **PLACING OF CONCRETE**

- .1 Place concrete in accordance with CAN/CSA A23.1/A23.2-M.
- .2 Slope concrete to levels shown on Contract Drawings.

- .3 Do not place concrete at such a rate as to endanger formwork or to prevent proper compaction.
- .4 Place concrete to prevent cold joints and segregation and vibrate sufficiently to ensure thorough compaction, maximum density in accordance to CAN/CSA A23.1/A23.2-M
- .5 Check work frequently with accurate instruments during placing of concrete.

3.6 **CONSOLIDATING**

- .1 Consolidate concrete in accordance with CAN/CSA A23.1/A23.2-M
- .2 Work concrete into complete contact with forms and embedded items. Consolidate concrete adjacent to side forms and along entire length of forms to ensure a smooth surface finish after stripping of formwork.

3.7 **CURING AND PROTECTION**

- .1 Cure and protect concrete in accordance with CAN/CSA A23.1/A23.2-M.
- .2 Apply curing compound after finishing operations have been completed, at rate recommended by compound manufacturer. Ensure compound application is uniform and continuous over entire area being cured.

3.8 **FINISHING**

- .1 Treat and finish exposed formed surfaces in accordance with CAN/CSA A23.1/A23.2-M.

3.9 **REMOVAL OF FORMS**

- .1 Do not disturb forms until concrete has hardened and developed sufficient strength to safely support its own weight and load on it.
- .2 Strip formwork in accordance with CAN/CSA A23.1-M.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

- .1 Labour, Products, equipment and services necessary for topping Work in accordance with the Contract Documents.

1.2 **REFERENCES**

- .1 ASTM C109M, Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens).

1.3 **SUBMITTALS**

- .1 Product data:
 - .1 Submit duplicate copies of manufacturer's Product data in accordance with Section 01 00 00 indicating:
 - .1 Performance criteria, compliance with appropriate reference standard(s), characteristics, and limitations.
 - .2 Product transportation, storage, handling and installation requirements.
 - .2 Shop drawings:
 - .1 Submit shop drawings in accordance with Section 01 00 00 indicating:
 - .1 Sections, details, materials, dimensions, thicknesses of each layer, maximum and minimum thicknesses, 3, 7, and 28 day load characteristics, and surface finishes.
 - .3 Certificates: Submit certification from manufacturer, stating that materials proposed for use are compatible with specified floor finishes.

1.4 **QUALITY ASSURANCE**

- .1 Installers qualifications: Perform Work of this Section by a company that has a minimum of five years proven experience in installations of a similar size and nature and that is approved by manufacturer. Submit to Consultant, applicator's current certificate of approval by the material manufacturer as proof of compliance.

1.5 **SITE CONDITIONS**

- .1 Do not install Work of this Section outside of following environmental ranges without Consultant's and Product manufacturer's written acceptance:
 - .1 Concrete temperature: 10°C minimum.
 - .2 Ambient air temperature: 16°C to 30°C.
 - .3 Precipitation: None.

- .2 Supply and install temporary protection and facilities to maintain Product manufacturer's, and above specified environmental requirements for 48 hours before, during, and 48 hours after installation.

2 Products

2.1 **MATERIALS**

- .1 Concrete based levelling compound:
 - .1 Compressive strength to ASTM C109, 28 day 4100 psi.
 - .2 Flexural strength to ASTM C109: 28 day 1000 psi.
 - .3 Primer: Type as recommended by topping manufacturer to suit intended condition.
 - .4 Acceptable material: 'Ardex K-15' by Ardex Engineered Cements or approved alternative.
- .2 Water: potable.

2.2 **MIXES**

- .1 Mix toppings in accordance with manufacturer's written instructions.

3 Execution

3.1 **EXAMINATION**

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.

3.2 **PREPARATION**

- .1 Remove loose, spalled, cracked, eroded and disintegrated concrete to solid surface.
- .2 Verify substrate surfaces are solid, free from surface water, frozen matter, dust, oil, grease, scaling or laitance, projections and any other foreign matter detrimental to performance.
- .3 Prohibit traffic on prepared areas until Work of this Section is completed.
- .4 Supply and install temporary protection to adjacent surfaces, floor drains, and steel angles to prevent damage resulting from Work of this Section.
- .5 Prior to application of topping, remove all debris by vacuuming.

3.3 INSTALLATION

- .1 Install topping in accordance with reviewed shop drawings and manufacturer's written instructions.
- .2 Let cure in accordance with manufacturer's, recommendations.

3.4 PROTECTION

- .1 Provide temporary protection for surfaces subjected to concentrated loads before they have cured sufficiently to carry them without damage.
- .2 Prevent traffic over completed areas, and protect Work of this Section from precipitation, freezing, and debris after final installation.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

.1 Labour, Products, equipment and services necessary for concrete block masonry work in accordance with the Contract Documents.

1.2 **REFERENCES**

.1 ASTM A1064/A1064-M, Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.

.2 ASTM C207, Specification for Hydrated Lime for Masonry Purposes.

.3 CSA A165 Series, CSA Standards on Concrete Masonry Units.

.4 CSA A179, Mortar and Grout for Unit Masonry.

.5 CSA A370, Connectors for Masonry.

.6 CSA A371, Masonry Construction for Buildings.

.7 CAN/CSA A3001, Cementitious Materials Compendium.

.8 CAN/CSA G30.18-M, Billet-Steel Bars for Concrete Reinforcement.

.9 CSA S304.1, Design of Masonry Structures.

1.3 **SUBMITTALS**

.1 Shop drawings:

- .1 Submit shop drawings in accordance with Section 01 00 00 indicating.
- .2 Wall sections and details, reinforcing and anchors, special detailing, patterning and locations of control joints.

.2 Samples:

- .1 Submit samples in accordance with Section 01 00 00:
- .2 Submit samples of each type and colour of masonry unit used prior to placing order.
- .3 Submit samples of masonry anchors, and ties.
- .4 Submit 250 x 200 mm samples of dampproof course.

.3 Quality control submittals: Submit manufacturer's certificates stating that materials supplied are in accordance with this Specification.

1.4 **QUALITY ASSURANCE**

- .1 Provide plain and reinforced masonry in accordance with CSA A370, CSA A371, and CSA S304.1.
- .2 Retain a licensed Professional Engineer, registered in Province of Ontario, to perform following services for unit masonry work:
 - .1 Design of masonry work.
 - .2 Design of reinforcing and anchors.
 - .3 Review, stamp and sign shop drawings.
 - .4 Conduct shop and field inspections and prepare and submit inspection reports.
- .3 Cold Weather Protection:
 - .1 To CAN/CSA-A371 and as follows:
 - .1 Maintain temperature of mortar between 5°C and 50°C until batch is used or becomes stable.
 - .2 Maintain ambient temperature of masonry work and it's constituent materials between 5°C and 50°C and protect site from windchill.
 - .3 Maintain temperature of masonry above 0°C for minimum of 3 days, after mortar is installed.
 - .4 Preheat unheated wall sections in enclosure for minimum 72 hours above 10°C, before applying mortar.
 - .5 Do not use scorched aggregate. Do not use salts or anti-freezes. Only use approved smokeless heaters.
- .4 Hot Weather Requirements:
 - .1 To CAN/CSA-A371 and as follows:
 - .1 Plan in advance for hot weather construction. Protect freshly laid masonry from drying too rapidly, by means of waterproof, non-staining coverings.
 - .2 Avoid using dry masonry in hot weather conditions. Use predampened masonry unit nominally saturated, but surface dry at time of laying. Do not dip masonry unit in bucket of water.
 - .3 Spread only enough mortar to permit soft setting of masonry units; do not over mix mortar materials; do not retemper mortar after 2 hours of use; do not retemper pigment coloured mortar; do not spread more than 900 mm of mortar for placement of masonry unit.

1.5 **DELIVERY, STORAGE, AND HANDLING**

- .1 Deliver, store and handle Products in accordance with the Conditions of the Contract and as specified herein.
- .2 Remove unacceptable materials from Site and replace to acceptance of Consultant. Store materials off ground protected from wetting by rain, snow or ground water, or inter-mixture with earth or other materials. Store metal ties and reinforcement to prevent corrosion.

- .3 Do not concentrate storage of materials on any part of structure beyond design load, take particular care not to overload unsupported portions of structure which may have not attained their full design strength.
- .4 Comply with CAN3-A371. Do not use salt or calcium-chloride to remove ice from masonry surfaces.
- .5 Deliver mortar materials in original unbroken and undamaged packages with the maker's name and brand distinctly marked thereon. Prevent damage to units.
- .6 Keep masonry materials free from ice and frost. Keep units protected from concrete, mortar and other materials which could cause staining.

2 Products

2.1 MASONRY UNITS

- .1 Concrete block units: Normalweight units, CSA A165 Series, sizes as indicated on Contract Drawing, classifications as follows:
 - .1 H/15/A/M.
 - .2 S/15/A/M.
 - .3 Sc/15/A/M.
- .2 Special shapes: Unless indicated otherwise, supply and install corner returns, bull-nosed or double bull-nosed units for exposed and external corners, bond beams, sash blocks for control joints, solid block where noted, concrete block lintels over openings in concrete block walls and any additional special shapes as indicated.
- .3 Obtain each masonry unit type from same manufacturer. Supply and install units of uniform texture and colour for each kind required.
- .4 Supply masonry units with exposed surfaces free of cracks, chips, blemishes, and broken corners.

2.2 ACCESSORIES

- .1 Wire reinforcement: CAN3-A370, CAN3 A371, and ASTM A1064/A1064-M, hot dip galvanized. This specification is based on products manufactured by Blok-Lok Limited. Products by Dur-O-Wal Ltd. and Fero Corporation are approved alternatives:
 - .1 Single wythe: Truss type; 'Blok-Trus BL30'.
- .2 Connectors: CSA A370 and CSA S304.1.
- .3 Reinforcing steel: CSA G30.18-M, Grade 400, refer to Contract Drawings for number, size, and location.

- .4 Loose steel lintels and lateral support angles: Supplied as part of work of Section 05 50 00.
- .5 Dampproof course and flashing: Reinforced SBS rubberized asphalt compound laminated to cross-laminated polyethylene film, 40 mils thick; 'Airshield Thru Wall Flashing' by W.R. Meadows or approved alternative, complete with primer and adhesive recommended by flashing manufacturer.
- .6 Compressible filler: 75 x 6 mm thick preformed, polyurethane foam; 25V by Emseal Joint Systems Ltd.
- .7 Control joint filler: Prefabricated extruded rubber joint to suit wall thickness; RS Series Rubber Control Joint by Blok-Lok or approved alternative.

2.3 MORTAR MATERIALS

- .1 Loadbearing masonry: CSA A179, Type S, proportion method.
- .2 Interior non-loadbearing masonry: CSA A179, Type N, proportion method.
- .3 Cement: CAN/CSA A3001, normal Portland, Type GU.
- .4 Hydrated lime: ASTM C207, Type S.
- .5 Masonry aggregate: CSA A179.
- .6 Water: Clean potable, free from deleterious elements and free from salts that can cause efflorescence.
- .7 Concrete fill and grout: 20 Mpa concrete in accordance with CSA A179.

3 Execution

3.1 EXAMINATION

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.

3.2 PROTECTION

- .1 Supply and install temporary waterproof, non-staining coverings, secured against displacement, to extend over walls and down sides to protect masonry work from snow and wind driven rain, and from drying too quickly, until masonry work is completed and protected by flashings or other permanent construction.

- .2 Supply and install non-staining, protective coverings on horizontal and vertical surfaces to protect work of this Section from damage, staining, marking, and mortar droppings.

3.3 **WORKMANSHIP**

- .1 Perform masonry work in accordance with CAN3 A371 and as indicated .
- .2 Supply and install masonry work plumb, level and true to line, with vertical joints in alignment and horizontal courses level, uniform, and straight.
- .3 Install masonry work to a plane flatness and exposed end tolerance of 3 mm in 2400 mm.
- .4 Variation in Alignment from Unit to Adjacent Unit: 1.5 mm maximum.
- .5 Variation of Mortar Joint Thickness: 3 mm every metre.

3.4 **MASONRY - GENERAL INSTALLATION**

- .1 Construct masonry work as required by jurisdictional authorities.
- .2 Before commencing masonry work, verify required limitations for wall heights, wall thicknesses, openings, bond, anchorage, lateral support, and compressive strengths of masonry units and mortars.
- .3 Construct masonry fire protection and fire separations of the thickness indicated on Drawings for the fire resistant ratings as noted on Drawings, and conforming to the Fire-Performance Ratings, Appendix 'D' to the National Building Code of Canada.
- .4 Fire Separations and Fire Separations with Fire Resistance Ratings: Construct walls tightly to construction above and at perimeter, and without openings or voids. Do not reduce the thickness of walls to less than the thickness indicated on the Drawings or for the required fire resistance rating where required.
- .5 Do not butter corner units, throw mortar droppings into joints, or excessively furrow bed joints. Do not shift or tap units after mortar has taken initial set. If adjustment is necessary after mortar has started to set, remove and replace with fresh mortar.
- .6 Do not use admixtures without Consultant's written acceptance.
- .7 Tool mortar joints slightly concave with non-staining tools unless indicated otherwise. Strike joints flush in non exposed areas or where shown on Contract Drawings. Use sufficient force to press mortar tight against masonry units on both sides of joints. Remove excess, remaining mortar material and burrs.
- .8 Install masonry walls 25 mm clear of underside of steel building frames, roof or floor deck. Install masonry with a 19 mm space beneath shelf angles and install compressible filler.

- .9 Cut masonry units with a wet saw to obtain straight, clean, even, unchipped edges. Cut units as required to fit adjoining work neatly or for flush mounted electrical outlets, grilles, pipes, conduit, leaving 3 mm maximum clearance. Use full-size units without cutting wherever possible.
- .10 Reinforce block walls with continuous wire reinforcement in every second block course. Supply and install prefabricated L and T sections. Cut, bend and lap reinforcing units as per manufacturer's printed directions for continuity at returns, offsets, pipe enclosures, and other special conditions. Bending of masonry reinforcement is not permitted.
- .11 Reinforce masonry walls with reinforcing steel as indicated on Drawings. Vertical reinforcing shall be fully grouted in masonry cores with grout.
- .12 At openings in block walls install extra reinforcement, so that first and second courses above and below openings are reinforced. Extend extra reinforcement 600 mm beyond opening in each direction.
- .13 Reinforce joint corners and intersections with strap anchors 400 mm o.c.
- .14 Do not place reinforcement across masonry wythes at control joints.
- .15 Install masonry with 10 mm thick joints unless indicated otherwise. Make vertical and horizontal joints equal and of uniform thickness.
- .16 Build control joints in masonry walls at intervals and in locations shown. Form joints for block walls using sash block units in accordance with details shown. Fill chase and joint with joint filler full height of control joints. Leave a depth of 13 mm for sealing unless otherwise shown.
- .17 Install control joints in masonry walls where indicated on drawings and at projections and changes in direction. Where control joints have not been indicated provide joints at 6100 mm o.c. for exterior walls and 9150 mm o.c. for interior walls.
- .18 Supply and install solid block or metal lath under block, and fill block cells solid for lintel bearing and as required to secure built-in anchor bolts and/or anchors shown.
- .19 Do not tooth intersections of walls except as otherwise indicated.
- .20 Coordinate installation of masonry with installation of air barrier and vapour retarder to ensure continuity of these systems.

3.5 DAMPPROOF COURSES

- .1 Install dampproof courses beneath first masonry bearing course on slabs-on-grade. Trim dampproofing to conceal it.
- .2 Lap dampproofing 150 mm and seal in accordance with manufacturer's instructions.

- .3 Before masonry work begins, place specified dampproofing under first course of masonry. Install continuous dampproofing with ends lapped and cut flush with exterior face of wall. Place similar dampproofing over top course.

3.6 **MORTAR MIXING**

- .1 Thoroughly mix mortar ingredients in proper quantities needed for immediate use to requirements of CSA A179.
- .2 Measure and batch mortar materials either by volume or weight, to accurately control and maintain proportions. Do not measure materials by shovel.
- .3 Mix mortar with maximum amount of water consistent with workability for maximum tensile bond strength within capacity of mortar.
- .4 Do not use mortar which has begun to set. Use mortar within 2 hours after initial mixing. Re-temper mortar during 2 hour period only as required to restore workability.
- .5 Add admixtures to requirements of manufacturer's instructions.
- .6 Provide uniformity of mix.

3.7 **BLOCK**

- .1 Lay blocks in running bond except as indicated otherwise. Align block webs vertically and install thicker ends of face shells up.
- .2 Install a full bed of mortar for first courses of masonry, for masonry units 100 mm thick and less, and between solid units. For remaining courses bed face shells, including vertical end joints, fully in mortar.
- .3 Install special shaped and sized concrete block units as indicated and as required for a complete and coordinated assembly and to minimize cut units.
- .4 Supply and install two courses of solid block beneath lintel bearing.
- .5 Stagger end joints in every course. Align joints plumb over each other in every other course.
- .6 Bond intersecting block walls in alternate courses. Where block work abuts concrete, anchor each block course to concrete.

3.8 **LINTELS**

- .1 Install concrete block lintels over openings in masonry except where steel lintels are indicated.
- .2 Set lintels with minimum of 200 mm uniformly distributed bearing at each end.

- .3 Install reinforcing steel and concrete fill in block lintels.
- .4 Install loose steel lintels, as indicated in Contract Drawings. Centre over opening width.

3.9 **LATERAL SUPPORT ANGLES**

- .1 Where non load bearing unit masonry partitions meet structural elements at top of partitions, provide lateral supports as required by the Ontario Building Code and in accordance with Structural details. In areas where ceilings are scheduled, use 150 mm lengths of steel angle located each side of partition at 1200 mm and staggered.

3.10 **BUILT-IN ITEMS**

- .1 Coordinate and locate build-in items required to be built into masonry or supplied under work of other Sections including hollow metal doors, windows, lintels, sleeves, inserts, etc. Build-in items to present a neat, rigid, true and plumb installation.
- .2 Build wall openings, slots, and recesses required for ducts, grilles, pipes and other items.
- .3 Coordinate installation of conduit, outlet boxes and other mechanical and electrical built-ins with work of Divisions 21, 22, 23 and 26.
- .4 Prevent displacement of built-in items during construction. Check plumb, location and alignment frequently, as Work progresses.
- .5 Brace door jambs to maintain plumbness. Set anchors between metal frames and masonry and fill voids between hollow metal frames and masonry walls with mortar.

3.11 **INSTALLATION TOLERANCES:**

- .1 Planes true to within 3 mm under 3 m straightedge.
- .2 Plumb within 6 mm in 3 m, or in 6 mm in 6 m at external corners, expansion joints, or other conspicuous lines.
- .3 Level within 6 mm in any bay or 6 m maximum distance, and 12 mm in 12 m or more.
- .4 Located from position shown, and from related position of columns, walls, and partitions within 12 mm in any bay or 6 m maximum distance, and 19 mm in 12 m or more.
- .5 Opening sizes within 6 mm of designated dimension.
- .6 Column and wall cross-section dimensions within minus 6 mm and plus 12 mm.
- .7 With joints to dimensions indicated, but in no case greater than 12 mm.

3.12 **REPAIR AND POINTING**

- .1 Remove and replace masonry units which are loose, chipped, broken, cracked, marked, stained, discoloured, or otherwise damaged. Supply and install new units to match adjoining units and install in fresh mortar, and point to eliminate evidence of replacement.
- .2 During tooling of joints, enlarge any cracks, holes, or other defects, point and completely fill with mortar.
- .3 Point-up joints including corners, openings and adjacent Work for a neat, uniform appearance, properly prepared for application of sealant compounds.

3.13 **CLEANING**

- .1 Obtain and follow unit masonry manufacturer's written instructions for cleaning of masonry.
- .2 Clean exposed, masonry surfaces, removing excess mortar as work progresses. Allow mortar droppings to partially dry then dry brush with a stiff fibre brush.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

.1 Design, labour, Products, equipment and services necessary for the miscellaneous and metal fabrication work in accordance with the Contract Documents.

1.2 **REFERENCES**

.1 ASTM A123, Specification for Zinc (Hot Dip Galvanized) Coatings on Iron & Steel Products.

.2 ASTM A153, Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

.3 ASTM A307, Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.

.4 ASTM A653/A653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.

.5 CISC/CPMA 1.73a, A Quick-Drying One-Coat Paint for Use on Structural Steel.

.6 CAN/CSA-G40.20/G40.21-M, General Requirements for Rolled or Welded Structural Quality Steel/ Structural Quality Steels.

.7 CAN/CSA S16.1-M, Limit States Design of Steel Structures.

.8 CSA S136.1-M, Commentary on CAN/CSA S136-M, Cold Formed Steel Structural Members.

.9 CSA W47.1, Certification of Companies for Fusion Welding of Steel Structures.

.10 CSA W48, Filler Metal and Allied Materials for Metal Arc Welding.

.11 CSA W59-M, Welded Steel Construction (Metal Arc Welding).

.12 CAN/CSA W117.2-M, Safety in Welding, Cutting and Allied Processes.

.13 CAN/CGSB 1.40-M, Primer, Structural Steel, Oil Alkyd Type.

.14 CGSB 85-GP-16M, Painting Galvanized Steel.

.15 Steel Structures Painting Council (SSPC), Steel Structures Painting Manual, Vol. 2.

1.3 **DESIGN REQUIREMENTS**

.1 Design details and connections, where not shown on Drawings, in accordance with CAN/CSA-S16.1 and CSA S136.1.

1.4 **SUBMITTALS**

- .1 Shop drawings:
 - .1 Submit shop drawings for fabrication and erection of miscellaneous and metal items in accordance with Section 01 00 00 indicating:
 - .1 Materials, core thicknesses, class of finish (AMP 555), connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.
 - .2 Ensure shop drawings are of one uniform size and based on field measurements.

1.5 **QUALITY ASSURANCE**

- .1 Retain a Professional Engineer, licensed in the Province of Ontario, with experience in work of comparable complexity and scope, to perform the following services as part of the work of this Section:
 - .1 Design metal fabrication items that are required to resist live, dead, lateral, wind, or seismic loads.
 - .2 Review, stamp, date and sign shop drawings.
- .2 Workmanship: Fabricate work of this Section to meet the required class of workmanship indicated below in accordance with AMP 555, Section 8.
 - .1 Class 1: for use on direct exposed to view fabricated items:
 - .1 Exposed surfaces are finished smooth with pits, mill marks, nicks, burrs, sharp edges, and scratches filled or ground off. Defects should not show when painted, polished, or finished.
 - .2 Welds should be concealed where possible. Exposed welds are ground to small radius with uniform sized cove unless otherwise noted.
 - .3 Distortions should not be visible to the eye.
 - .4 Exposed joints are fitted to a hairline finish.
- .3 Execute welding by firms certified in accordance with CSA W47.1 Division 1 or 2.1. Ensure welding operators are licensed per CSA W47.1 for types of welding required by Work.

2 Products

2.1 **MATERIALS**

- .1 General:
 - .1 All materials under work of this Section, including but not limited to, primers and paints are to have low VOC content limits.
 - .2 Unless detailed or specified herein, standard products will be acceptable if construction details and installation meet intent of Drawings and Specifications.
 - .3 Include all materials, products, accessories, and supplementary parts necessary to complete assembly and installation of work of this Section.

- .4 Incorporate only metals that are free from defects which impair strength or durability, or which are visible. Install only new metals of best quality, and free from rust or waves and buckles, and that are clean, straight, and with sharp defined profiles.
- .2 Structural shapes, plates, and similar items: CAN/CSA-G40.20/G40.21-M, Grade 350W. Hollow structural sections: CAN/CSA-G40.20/G40.21-M, Grade 350W, Class H.
- .3 Galvanized sheet steel: ASTM A653/A653M Grade A, Z275 Commercial Quality zinc coating, size and shape as shown.
- .4 Welding materials: CSA W48 and CSA W59-M.
- .5 Fasteners: Conforming to ASTM A307, Grade A, in areas not exposed to view, use unfinished bolts with hexagon heads and nuts. In areas exposed to view, use bolts, nuts, washers, rivets, lock washers, anchor bolts, machine screws and machine bolts Z275 zinc coated in accordance with ASTM A653/A653M. Supply bolts of lengths required to suit thickness of material being joined, but not projecting more than 6 mm beyond nut, without the use of washers.
- .6 Primer paint: CAN/CGSB-1.40-M or CPMA 1.73a.
- .7 Galvanized primer paint: Inorganic zinc rich primer. For use on galvanized fabrications where touch up is to remain unpainted in finished work; Carbozinc 11WB by Carboline Company, Catha-Coat 305 by Devoe Coatings or Zinc Clad XI by Sherwin Williams.
- .8 Drilled inserts: Mega by ITW Construction Products or HSL by Hilti Inc. heavy-duty anchors, sizes as shown.

2.2 FABRICATION

- .1 Verify dimensions of existing Work before commencing fabrications and report any discrepancies to the Consultant.
- .2 Fit and assemble work in shop where possible. Execute work in accordance with details and reviewed shop drawings.
- .3 Use self-tapping shake-proof screws on items requiring assembly by screws or as indicated. Use screws for interior metal work. Use welded connections for exterior metal work unless otherwise found acceptable by the Consultant.
- .4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush. Seal exterior steel fabrications against corrosion in accordance with CAN/CSA S16.1-M.
- .5 Execute shop welding to requirements specified .

- .6 Carefully make and fit details. Take special care with exposed finished work to produce a neat and correct appearance to the Consultant's acceptance.
- .7 Assemble members without twists or open joints.
- .8 Correctly size holes for connecting work of other trades where such can be determined prior to fabrication. Where possible, show holes on shop drawings. Place holes not to cause appreciable reduction in strength of member.
- .9 Draw mechanical joints to hairline tightness and seal countersunk screw and access holes for locking screws with metal filler where these occur on exposed surfaces.

2.3 FABRICATED ITEMS

- .1 Refer to Drawings for details of metal fabrication work and related items not specifically listed in this Section.
- .2 Where work is required to be built into work of other Sections supply such members to respective Sections.
- .3 Provide metal fabrication items indicated below and items not indicated to be supplied under other Sections. The following items includes miscellaneous and metal fabrication including but not limited to the items listed below.
- .4 Lintels: Fabricated from CAN/CSA-G40.20/G40.21-M, Grade 350W, size and location as shown, width to be not less than 25 mm less than width of wall and extend 200 mm beyond opening at each end. Unless otherwise shown, fabricate lintels in block walls of steel sections.
- .5 Miscellaneous steel brackets, supports and angles
 - .1 Supply and install or supply for installation by trades responsible, all loose steel brackets, supports and angles where indicated, except where such brackets, supports and angles are specified under work of other Sections. Drill for countersunk screws, expansion anchors and anchor bolts.
 - .2 Unless otherwise specified, prime paint for interior installation.

2.4 ANCHORS AND FASTENING

- .1 Use weld studs of size not larger than 10 mm for attaching miscellaneous materials and equipment to building steel. If weight of item requires larger fasteners use clips or brackets and secure by welding or through bolting.
- .2 Use self drilling expansion type concrete anchors for attaching to masonry and concrete
- .3 Do not secure items to steel deck.
- .4 Use steel beam clamps of two bolt design to transmit load to beam web. Do not use C and I clamps.

2.5 WELDING

- .1 Perform welding by electric arc process.
- .2 Execute welding to avoid damage or distortion to Work. Execute welding in accordance with following standards:
 - .1 CSA W48 - for Electrodes. If rods are used, only coated rods are allowed.
 - .2 CSA W59-M and CSA W59S1-M for design of connections and workmanship.
 - .3 CAN/CSA W117.2-M - for safety.
- .3 Thoroughly clean welded joints and expose steel for a sufficient distance to perform welding operations. Finish welds smooth. Supply continuous and ground welds which will be exposed to view and finish paint.
- .4 Test welds for conformance and remove work not meeting specified standards and replace to Consultant's acceptance.

2.6 SHOP PAINTING

- .1 Clean steel to SSPC SP6 and remove loose mill scale, weld flux and splatter.
- .2 Shop prime steel with one coat of primer paint to dry film thickness of 0.07 mm. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7 deg C. Paint items under cover and leave under cover until primer is dry. Follow paint manufacturer's recommendations regarding application methods, equipment, temperature, and humidity conditions.
- .3 Shop prime galvanized steel in accordance with CGSB 85-GP-16M.
- .4 Clean but do not paint surfaces being welded in field.
- .5 Do not paint surfaces embedded in concrete, but clean as if they were to be primed.
- .6 Do not prime steel to be fireproofed or to receive intumescent paint coating.
- .7 Do not prime machine finished surfaces, but apply an effective anti-rust compound.
- .8 Take precautions to avoid damage to adjacent surfaces.

2.7 HOT DIP GALVANIZING

- .1 After fabrication, hot dip galvanize specific miscellaneous steel items as indicated. After galvanizing, plug relief vents air tight with appropriate aluminum plugs as suitable and required for intended metal fabricated item. Straighten shapes and assemblies true to line and plane after galvanizing. Repair damaged galvanized surfaces with zinc rich primer in accordance with manufacturer's printed directions.

- .2 Hot-dip galvanize members in accordance with requirements of the following ASTM, with minimum coating weights or thicknesses as follows:
 - .1 Rolled, pressed and forged steel shapes, plates, bars and strips: ASTM A123; average weight of zinc coating per square/metre of actual surface, for 4.8 mm and less thickness members 600 g/m² for 6 mm and heavier members 640 g/m².
 - .2 Iron and steel hardware: ASTM A153; minimum weight of zinc coating, in ounces per square foot of surface, in accordance with ASTM A153, Table 1 for the various classes of materials used in the Work.

3 Execution

3.1 **EXAMINATION**

- .1 Examine previously installed Work, upon which this Section depends, verify dimensions and condition of existing Work, and coordinate repairs, alterations, and rectification if necessary. Commencement of work of this Section is deemed to signify acceptance of existing, prior conditions.
- .2 Obtain Consultant's written approval prior to field cutting or altering of structural members.

3.2 **ERECTION**

- .1 Install metal fabrications in accordance with reviewed shop drawings and manufacturer's written instructions.
- .2 Fit joints and intersecting members accurately. Make work in true planes with adequate fastenings. Build and erect work plumb, true, square, straight, level and accurate to sizes detailed, free from distortion or defects detrimental to appearance or performance.
- .3 Perform drilling of concrete and steel as required to fasten work of this Section.

3.3 **TOUCH UPS**

- .1 Paint bolt heads, washers, nuts, field welds and previously unpainted items. Touch up shop primer damaged during transit and installation, with primer to match shop primer.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

.1 Labour, Products, equipment and services necessary for rough carpentry work in accordance with the Contract Documents.

1.2 **REFERENCES**

.1 ASTM A325, Specification for Bolts Quenched/Tempered Steel Nominal Thread Diameter M16 - M36 For Structural Steel Joints.

.2 ASTM A653, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.3 ASTM D2898, Standard Practice for Accelerated Weathering of Fire Retardant Treated Wood for Fire Testing.

.4 ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials.

.5 ASTM F1667, Driven Fasteners: Nails, Spikes and Staples.

.6 CAN/CSA O80 Series M, Wood Preservation.

.7 CAN/CSA O141, Softwood Lumber.

.8 CAN/ULC-S102, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

.9 NLGA, Standard Grading Rules for Canadian Lumber, National Lumber Grades Authority

1.3 **QUALITY ASSURANCE**

.1 Lumber identification: Grade stamp of an agency certified by the Canadian Lumber Standards Accreditation Board.

.2 Lumber quality: Carefully select individual pieces so that knots and obvious defects will not interfere with placing bolts, proper nailing or making proper connections.

.3 Moisture Content of wood at time of construction shall be 19% maximum.

.4 Each piece of pressure treated lumber and fire retardant treated lumber shall be shop marked with the pressure treatment brand and ULC monogram respectively, in accordance with CAN/CSA O80-M.

5. Dimensions of lumber shall conform to dressed sizes specified in CAN/CSA-0141 unless actual dimensions are otherwise indicated or specified.

6. Dimensional references to lumber on Drawings and in Specifications are to nominal sizes unless actual dimensions are indicated. Such actual dimensions shall be dry size.
- .7 Lumber defects: Discard wood with defects which will render a piece unable to serve its intended function. Lumber will be rejected by Consultant for excessive warp, twist, bow, crook, mildew, fungus, or mould, as well as for improper cutting and fitting, whether or not it has been installed.

1.4 ENVIRONMENTAL REQUIREMENTS

1. When it is required that wood maintain dimensional stability and tolerances to ensure accurate installation of later work, store and install it only in dry areas, and where no further installation of moist materials is contemplated.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- .1 Store materials in a dry area. Cover materials with tarpaulins or polyethylene sheets to prevent moisture absorption and impairment of structural and aesthetic properties. Vent to allow air movement. Tie covering to keep in place.

2 Products

2.1 MATERIALS

- .1 General: All materials under work of this Section, including but not limited to, adhesives are to have low VOC content limits.
- .2 Lumber: Softwood, G4S, moisture content 19% or less at time of installation, in accordance with the following:
 - .1 Lumber shall be of same species and grade, equally seasoned and shall be processed and stamped at same mill.
 - .2 CSA O141 and NLGA Standard Grading Rules for Canadian Lumber.
 - .3 Board quality: Construction or better.
 - .4 Dimension quality:
 - .1 Structural joists, planks, and framing: No. 1 Select Structural.
 - .2 Light framing: Construction.
- .3 Fire retardant treatment of lumber and plywood (interior and protected locations): 'Dricon FRT' fire retardant treatment by Biewer Lumber or approved alternative, conforming to ASTM E84, to provide a flame spread rating of 25 or less.
- .4 Rough hardware: Conforming to ASTM F1667; Nails, bolts, screws, anchors, expansion shields, and other fastenings required to frame and fix rough carpentry as follows:
 - .1 Nails, spikes and staples: Spiral type.
 - .2 Bolts: ASTM A325; 12.7 mm diameter minimum with nuts and washers unless noted otherwise.

- .3 Screws: Countersunk head, full thread type.
- .4 Proprietary fasteners: Toggle bolts, expansion shields, lag bolts, screws, inorganic fibre plugs, recommended for purpose by manufacturer.
- .5 Galvanize rough hardware used in fire treated wood and hardware exposed to the atmosphere.

3 Execution

3.1 **EXAMINATION**

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.

3.2 **GENERAL**

- .1 Lay out work carefully and to accommodate work of others. Cut and fit accurately: erect in position indicated by Drawings.
- .2 Install rough carpentry to allow for expansion and contraction of the materials.
- .3 Cut work into lengths as long as practicable and with square ends. Align, level, square, plumb, and secure work permanently in place. Brace work temporarily as required. Join work only over solid backing.
- .4 Bore holes true to line and to same size as bolts. Drive bolts into place for snug fit, and use plates or washers for bolthead and nut bearings. Turn up bolts and lag screws tightly when installed, and again just before concealed by other work or at completion of Work.
- .5 Provide anchors, bolts, and inserts required for attachment of the work of this Section, to those performing the work of other Sections and who are responsible for their installation.
- .6 Do not attach work by wood plugs or blocking in concrete or masonry. Use lead shields, expansion shields, or similar methods only as approved by Consultant.

3.3 **MISCELLANEOUS WOODWORK**

- .1 Fit and install wood furring, strapping, grounds and blocking. Adequately size, correctly place and conceal members for finishes, fitments and for work under other Sections. Do not assume that Drawings show required work exactly or completely. Anchor wood members securely in place.
- .2 Install rough bucks, nailing strips and linings to rough openings as required for backing for frames and other work.

- .3 Except where steel supports are specifically shown, provide wood blocking and supports in metal stud partitions for fastening of item such as casework and other wall mounted accessories. Have respective trades approve the location of such wood blocking.
- .4 Bolt wood blocking or nailing strips to steel framing.
- .5 Align and plumb faces of furring and blocking to tolerance of 1:600.
- .6 Use fire retardant lumber for blocking/framing in ceiling\ spaces, partitions and bulkheads.

3.4 **FASTENERS**

- .1 Frame, anchor, fasten, tie and brace members for required strength and rigidity.
- .2 Use hot dipped galvanized fasteners for exterior work and work below grade.
- .3 Countersink bolts and bolt heads as required for clearance of other work.
- .4 Size fasteners to penetrate base member by half of fastener length minimum. Minimize splitting of wood members by staggering nails in direction of grain.
- .5 For plywood use spiral, annular or resin coated nails and staples.

3.5 **SURFACE-APPLIED WOOD PRESERVATIVE**

- .1 Treat raw surfaces, drilled holes and cut ends of pressure treated wood with 2 coats of wood preservative immediately after cutting.
- .2 Apply preservative by dipping, by brush or by pouring into plugged holes to completely saturate surface.

END OF SECTION

- 1 General
- 1.1 **SECTION INCLUDES**
 - .1 Labour, Products equipment and services necessary for the finish carpentry work in accordance with the Contract Documents.
- 1.2 **REFERENCES**
 - .1 ANSI A208.1, Particleboard.
 - .2 ANSI/NEMA LD 3, High-Pressure Decorative Laminates.
 - .3 APA - The Engineered Wood Association.
 - .4 ASTM F1667, Driven Fasteners: Nails, Spikes and Staples.
 - .5 Architectural Woodwork Manufacturers Association of Canada (AWMAC).
 - .6 Architectural Woodwork Standards (AWS) - Quality Standards for Architectural Woodwork.
 - .7 CAN/CSA O141, Softwood Lumber.
 - .8 CSA O151-M, Canadian Softwood Plywood.
 - .9 National Lumber Grades Authority (NLGA) Standard Grading Rules for Canadian Lumber.
- 1.3 **SUBMITTALS**
 - .1 Shop drawings: Submit shop drawings of finish carpentry work in accordance with Section 01 00 00 indicating materials, thicknesses, sizes, finishes, wood species, grades, profiles, connection attachments, shop jointing, field jointing, reinforcing, anchorage, fastener types and sizes, location of exposed fastenings, mechanical and electrical service routes, service outlets, cutout locations, and sizes. Include erection drawings, plans, elevations, sections, and details as applicable.
 - .2 Samples: Submit samples of the following in accordance with the requirements of Section 01 00 00:
 - .1 Two of each colour, pattern, gloss, and texture of plastic laminate, in manufacturer's standard tag size.
 - .2 Two samples of laminated plastic joints, edging, cutouts and postformed profiles.
 - .3 Two of each solid surface, in 100 x 75 x 12 mm samples.
 - .4 Two samples of melamine surfaced board, edging and postformed profiles.
 - .5 One of each item of finish carpentry hardware.

1.4 **QUALITY ASSURANCE**

- .1 Execute work of this Section by member of AWMAC, with 5 years experience in finish carpentry Work of comparable complexity and scope. Submit proof of experience upon Consultant's request.
- .2 Fabricate finish carpentry work in accordance with AWS Quality Standards, Premium Quality materials and installation unless otherwise indicated. Perform work in accordance with the definition of Good Workmanship as defined in the AWS Quality Standards.
- .3 Remove and replace finish carpentry Work which does not conform to the AWS Quality standards or as amended by these Specifications.
- .4 Mock-up:
 - .1 Shop fabricate one mock-up of a base cabinet, wall cabinet, and counter top for each type of surfacing specified, complete with hardware and shop applied finishes, installed in location acceptable to Consultant.
 - .2 Shop fabricate one mock-up of a medial records cart, complete with hardware and shop applied finishes, installed in location acceptable to Consultant.
 - .3 Arrange for Consultant's review and acceptance, allow 48 hours after acceptance before proceeding with Work.
 - .4 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of Work if accepted by Consultant. Remove and dispose of mock-ups which do not form part of Work.

1.5 **DELIVERY, STORAGE, AND HANDLING**

- .1 Deliver, store, and handle finish carpentry in accordance with the AWS Quality Standards. Control the temperature and humidity in accordance with the AWS recommendations, before, during, and after finish carpentry delivery, and also during storage and installation.
- .2 Cover finished plastic laminated work with heavy kraft paper or put in cartons during shipment. Protect installed surfaces by approved means. Do not remove until immediately before final inspection.

1.6 **EXTENDED WARRANTY**

- .1 Submit an extended warranty for plastic laminate work of this Section in accordance with General Conditions, except that warranty period is extended to 2 years from date of Substantial Performance of the Work.
 - .1 Warrant against defects in material and workmanship including but not limited to opening of joints, cracking, shrinkage, warpage, and delamination of plastic laminate.
 - .2 Coverage: Complete replacement including affected adjacent Work.

2 Products

2.1 **MATERIALS**

.1 General:

- .1 All materials under work of this Section, including but not limited to, adhesives and mastics, are to have low VOC content limits.
- .2 Adhesives - Urea-formaldehyde-free glues.

.2 Concealed framing lumber and plywood:

- .1 Eastern Spruce, Balsam Fir, or Jack Pine, to CAN/CSA O141, NLGA, and AWS Custom Grade, S4S, average moisture content 7% +/- 2% at installation.
- .2 Softwood plywood: CSA O151-M; 19 mm unless indicated otherwise, (G2S).

.3 Veneer core plywood (substrate): APA plywood, Grade A-D, in sizes, thickness and shapes as indicated.

.4 Plastic laminate (**PLAM**): Provide plastic laminates conforming to ANSI/NEMA LD 3 as follows:

- .1 Flatwork face sheet: 1.2 mm thick, heavy wear resistance.
- .2 Vertical interior face sheets: 0.8 mm thick.
- .3 Postformed face sheet: 0.8 mm thick.
- .4 Backing sheet: thickness to match face sheet, high pressure laminate, manufactured by same manufacturer as face sheet.
- .5 Plastic laminate: As manufactured by Arborite, Formica, Forbo, Nevamar, Pionite and Wilsonart.
- .6 Colours: Colours/patterns to match existing.

.5 RESERVED.

.6 RESERVED.

.7 Laminating adhesive: CSA O112 Series, water resistant type, low VOC content, selected by laminate manufacturer for intended end use.

.8 Fire retardant treatment: In accordance with Section 06 10 00.

.9 Draw bolts and splines: Type as recommended by fabricator.

- .10 Nails and staples: Conforming to ASTM F1667; Size and type to suit application, galvanized for exterior work, interior humid areas and for treated lumber; plain finish elsewhere.
- .11 Bolts, nuts, washers, blind fasteners, lags and screws: Size and type to suit application. Stapling is not acceptable.
- .12 Adhesive and bituminous mastic: Selected by the millwork fabricator with low VOC content.
- .13 Miscellaneous metals: In accordance with Section 05 50 00.

2.2 **HARDWARE**

- .1 The following hardware is the minimum quality standard for the work of this Section. Alternatives may be considered provided they are approved by Consultant prior to ordering of products.
- .2 Drawer slides: Full extension, 8400 Series by Knape & Vogt.
- .3 Pilasters: Clear anodized aluminum recessed shelf standards with 12 mm divisions, Model 233 by Knape & Vogt.
- .4 Clips: Bright zinc plated, adjustable height shelf supports, Model 256 by Knape & Vogt.
- .5 Cabinet hinges: Heavy duty, concealed, 100 degree, clip, self closing, Model MODUL by Blum.
- .6 Drawer and cabinet pulls: Stainless steel D pulls, manufactured by Canadian Builders Hardware.
- .7 Magnetic catches: Model 918 by Knape & Vogt.
- .8 Locks: Cam locks/deadbolt locks complete with lock core by Hafele, type to suit application and installation.

2.3 **PLASTIC LAMINATE WORK**

- .1 Perform plastic laminate work in accordance with AWS Quality Standards and ANSI/NEMA LD 3.
- .2 Ensure adjacent parts of continuous laminate work match in colour and pattern.
- .3 Laminate plastic laminates to core materials in accordance with manufacturer's instructions.
- .4 Fabricate core surfaces and profiles with continuous support and bond over entire surface to receive plastic laminate.

- .5 Apply plastic laminate backing sheets to balance shrinkage stresses induced by plastic laminate face sheets.
- .6 Minimize joints in plastic laminate Work; do not install joints in plastic laminate Work in less than 2400 mm o.c. Locate joints minimum 610 mm from cut-outs. Offset core and plastic laminate facing joints.
- .7 Form shaped profiles and bends as indicated, using postformed grade laminate to laminate manufacturer's instructions.
- .8 Edging to be done using 3 mm thick PVC to match plastic laminate colour to cover exposed edge of core material. Chamfer exposed edges uniformly at approximately 20 degrees. Do not mitre laminate edges.
- .9 Apply laminated plastic liner sheet to interior of cabinetry and where indicated.

2.4 FABRICATION

- .1 Millwork core materials are to be as shown in the Architectural Drawings. Where 'plywood' core is indicated it is intended that other ply cores such as MDF, particlecore, particleboard, fibreboard etc. are not acceptable.
- .2 Be responsible for methods of construction and for ensuring that materials are rigidly and securely attached and will not be loosened by the work of other sections.
- .3 Coordinate locations of concealed supports and blocking with other parts of Work. Provide cutouts for outlet boxes and other fixtures.
- .4 Fabricate work in a manner which will permit expansion and contraction of the materials without visible open joints. Conceal joints and connections in wherever possible.
- .5 Finished millwork shall be free from defects and shall be selected for uniformity of colour and texture.
- .6 Shelving to cabinetwork to be adjustable unless otherwise noted.
- .7 Recess shelf standards, unless noted otherwise. Stagger recessed shelf standards on opposite sides of divider.
- .8 Do not exceed maximum 760 mm unsupported span for 19 mm thick shelving. House fixed shelving into gables and divisions.
- .9 Shop assemble finish carpentry to accommodate delivery and handling and to ensure passage through building openings.
- .10 Shop install cabinet hardware for doors, shelves and drawers. Recess shelf standards unless noted otherwise.

- .11 Fabricate units by solid surfacing manufacturer's certified or approved fabricator/installer. Fabricate built-up profiles as indicated.

3 Execution

3.1 **EXAMINATION**

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.

3.2 **INSTALLATION**

- .1 Install work in accordance with AWS Quality Standards and tolerances for Architectural Woodwork. Set and secure finish carpentry in place, rigid, plumb, square, and level.
- .2 Scribe and cut as required, fit to abutting walls, and surfaces, fit properly into recesses and to accommodate columns, fixtures, outlets, or other projecting, intersecting or penetrating objects leaving a 0.8 mm gap maximum.
- .3 Coordinate cutouts for plumbing fixtures, inserts, appliances, outlet boxes, and other fixtures, in finish carpentry. Round internal corners of cut-outs and seal exposed cores.
- .4 Form joints to conceal shrinkage.
- .5 Install draw bolts and splines in laminated plastic counter top joints at maximum spacing 450 mm o.c., and 75 mm from edge. Make joints flush, hairline butt joints.
- .6 Install finishing hardware accurately and securely in accordance with manufacturer's directions, adjust and clean.
- .7 Install prefinished millwork at locations shown on drawings. Position accurately, level, plumb straight.
- .8 Apply bituminous coating over wood framing members in contact with masonry or cementitious construction.
- .9 Melamine panels: Assemble melamine millwork using dowelled/wafered-and-glue construction. Installed melamine panels shall not show any exposed fasteners on finished/exposed surfaces.
- .10 Solid surfacing:
 - .1 Install solid surfacing in accordance with manufacturer's instructions.
 - .2 Align work plumb and level.
 - .3 Seal perimeter of fabrication to adjacent construction in accordance with Section 07 92 00.

- .11 Fastening:
 - .1 Coordinate wall securement, anchorage, and blocking for finish carpentry items.
 - .2 Position items of finished carpentry work accurately, level, plumb, true and fasten or anchor securely.
 - .3 Design and select fasteners to suit size and nature of components being joined. Use proprietary devices as recommended by manufacturer.
 - .4 Provide heavy duty fixture attachments for wall mounted cabinets.
 - .5 Set finishing nails to receive filler. Where screws are used to secure members, countersink screw in round cleanly cut hole and plug with wood plug to match material being secured.

- .12 Remove and replace damaged, marked, or stained finish carpentry.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

.1 Labour, Products, equipment and services necessary for firestopping and smoke seals Work in accordance with the Contract Documents.

1.2 **REFERENCES**

.1 ASTM E814, Test Method for Fire Tests of Through-Penetration Fire Stops.

.2 CAN/CGSB 19.13, Sealing Compound, One Component, Elastomeric, Chemical Curing.

.3 CAN/ULC S102, Surface Burning Characteristics of Building Materials and Assemblies.

.4 CAN/ULC S115, Standard Method of Fire Tests of Firestop Systems.

.5 CAN/ULC S702, Thermal Insulation, Mineral Fibre for Buildings.

1.3 **SUBMITTALS**

.1 Product data:

.1 Submit copies of manufacturer's Product data in accordance with Section 01 00 00 indicating:

.1 Performance criteria, compliance with appropriate reference standard, characteristics, limitations.

.2 Product transportation, storage, handling and installation requirements.

.3 Submit firestop and smoke seal manufacturer's Product data for materials and prefabricated devices, including manufacturer's printed installation instructions.

.2 Shop drawings:

.1 Submit shop drawings in accordance with Section 01 00 00 indicating:

.1 Fire rated and smoke sealed systems for each typical application.

.2 Construction details, accurately reflecting actual job conditions.

.3 ULC or Intertek Testing assembly listing.

.3 Certification:

.1 Submit certified documentation from manufacturer for each worker performing Work of this Section.

.2 Submit installer's and Product manufacturer's certification verifying compliance with the Contract Documents and conformance with ASTM E814 and CAN/ULC S115.

1.4 **QUALITY ASSURANCE**

- .1 Perform Work of this Section by manufacturer-approved, skilled, qualified, and experienced workers trained in installation of Work of this Section.

1.5 **SITE CONDITIONS**

- .1 Conform to manufacturer's requirements and maintain a minimum temperature of 5° C for a minimum period of 24 h before application, during, and until application is fully cured.
- .2 Maintain sealant at a minimum 18° C for best workability.

2 Products

2.1 **ACCEPTABLE MANUFACTURERS**

- .1 Acceptable manufacturers of rated systems include:
 - .1 AD Fire Protection Systems Inc.
 - .2 Hilti Canada Corporation.
 - .3 3M Canada Inc.
 - .4 Tremco Ltd.

2.2 **MATERIALS**

- .1 All materials under Work of this Section, including but not limited to, primers and sealants are to have low VOC content limits.
- .2 Firestop sealant: single component, low modulus, silicone rubber, moisture curing, ULC labelled to CAN/CGSB 19.13-M and CAN/ULC S115.
- .3 Firestop insulation: to CAN/ULC-S702, Type 2; mineral fibre manufactured from rock or slag, suitable for manual application.
 - .1 Density: Minimum 64 kg/m³ when tested to ASTM C303.
 - .2 Combustibility: Noncombustible to CAN/ULC S114.
 - .3 Melt temperature: >1175 degrees C.
 - .4 Surface burning characteristics: to CAN/ULC S102, maximum flame spread of 0, smoke developed of 0.
 - .5 Moisture Absorption: 0.04 percent when tested to ASTM C1104.
 - .6 Smoulder Resistance: 0.01 percent when tested to CAN/ULC S129.
- .4 Damming, back-up, supports, and anchorage: In accordance with manufacturer's fire rated systems and to acceptance of authorities having jurisdiction.
- .5 Primer: As recommended by firestopping sealant manufacturer.

2.3 **SYSTEMS**

- .1 Firestopping and smoke seals: ULC or Intertek Testing Services listed Products and systems in accordance with CAN/ULC S115 suitable to actual application and installation conditions.
- .2 Do not use Products containing asbestos.
- .3 Firestopping components shall not contain volatile solvents or require special application to protect plastic pipe from firestopping compound.

3 Execution

3.1 **EXAMINATION**

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.
- .2 Verify that substrates and surfaces to receive firestopping and smoke seals are clean, dry, and frost free.

3.2 **FIRESTOP AND SMOKE SEAL LOCATIONS AND RATINGS**

- .1 Install ULC firestop and smoke seal system rated to match fire resistance ratings and smoke seal ratings of assemblies into which they are installed.
- .2 Install firestop and smoke seal systems. Use systems with required fire and smoke ratings at following typical locations, including but not limited to:
 - .1 Gaps at intersections of fire-resistance rated masonry and gypsum board partitions.
 - .2 Control and sway joints in fire-resistance rated walls and partitions such as masonry and gypsum board.
 - .3 Gaps at top of fire-resistance rated partitions such as masonry and gypsum board partitions.
 - .4 Penetrations through fire-resistance rated walls and partitions including mechanical and electrical services and openings and sleeves for future use.
 - .5 Penetrations through fire-resistance rated floor slabs, ceilings, and roofs.
 - .6 Perimeter of retaining angles on rigid ducts greater than 0.012 m², firestopping material between retaining angle and fire separation and between retaining angle and duct, on each side of fire separation.
 - .7 At non-rated assemblies that require a smoke seal.
 - .8 Where required by Ontario Building Code.

3.3 **PREPARATION**

- .1 Prepare, modify, and adjust void sizes, proportions, and conditions to conform to fire rated and smoke sealed assembly requirements such as assembly opening size and dimensional restrictions.
- .2 Mask adjacent surfaces to avoid spillage and over-coating of adjacent surfaces. Remove stains from adjacent surfaces.

3.4 **INSTALLATION**

- .1 Install firestopping and smoke seal systems in accordance with manufacturer's instructions and fire rated assembly to establish continuity and integrity of fire separations.
- .2 Install firestop insulation in compacted thicknesses required by ULC design. Compress insulation approximately 50 percent.
- .3 Install primers as recommended by firestop and smoke seal Product manufacturers.
- .4 Install temporary forming, damming, back-up as required, remove after materials have achieved initial cure and will resist displacement.
- .5 Install firestop and smoke seal filler in horizontal joints providing 25% compression fit.
- .6 Use resilient, elastomeric firestopping and smoke seal systems in following locations:
 - .1 Openings and sleeves for future use.
 - .2 Penetration systems subject to vibration or thermal movement.
 - .3 Penetration systems in acoustical containment enclosures.
- .7 Trowel and tool exposed firestop and smoke seal Product surfaces to uniform, smooth finish.
- .8 Repair damaged firestopped and smoke sealed surfaces to acceptance of Consultant.
- .9 Identify each firestop and smoke seal penetration assembly with permanent label listing following:
 - .1 Assembly and rating in hours.
 - .2 Date of installation.
 - .3 Installing company's name and telephone number.
- .10 Do not cover materials until full cure has taken place.

3.5 **CLEAN-UP**

- .1 Remove excess materials and debris and clean adjacent surfaces immediately after application.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

- .1 Labour, Products, equipment and services necessary for sealant work in accordance with the Contract Documents.
- .2 Work of this Section does not include sealants in firestopping and smoke sealed assemblies.
- .3 Work of this Section does not include sealant work identified in individual specification sections.

1.2 **REFERENCES**

- .1 ASTM C834, Specification for Latex Sealants.
- .2 ASTM C920, Specification for Elastomeric Joint Sealants.
- .3 ASTM C1330, Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.

1.3 **SUBMITTALS**

- .1 Product data: Submit copies of Product data in accordance with Section 01 00 00 describing type, composition and recommendations or directions for surface preparation, material preparation and material installation.
- .2 Samples:
 - .1 Submit following samples in accordance with Section 01 00 00:
 - .1 Two samples of sealant/caulking, for colour selection.
 - .2 Two samples of back-up material and primer for physical characteristics.
- .3 Extended warranty: Submit extended warranty signed and registered by the manufacturer providing the warranty in the name of the Owner for the timeframe and coverage specified in this Section.

1.4 **QUALITY ASSURANCE**

- .1 Qualifications: Work of this Section shall be executed by trained applicators approved by sealant manufacturer and having a minimum of 5 years proven experience.

1.5 **SITE CONDITIONS**

- .1 Do not install materials when ambient air temperature is less than 5°C, when recesses are wet or damp, or to manufacturer's recommendations.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Arrange delivery of materials in original, unopened packages with labels intact, including batch number, and ensure that on-site storage is kept to a minimum. Do not store materials on site where there exists any danger of damage from moisture, direct sunlight, freezing and other contaminants.

1.7 EXTENDED WARRANTY

- .1 Submit an extended warranty for Sealant work in accordance with General Conditions, except that warranty period is extended to 2 years from date of Substantial Performance of the Work.
 - .1 Warrant against leakage, cracking, crumbling, melting, shrinkage, running, loss of adhesion and staining adjacent surfaces.
 - .2 Coverage: Complete replacement including affected adjacent work.

2 Products**2.1 MATERIALS**

- .1 General:
 - .1 All materials under work of this Section, including but not limited to, primers and sealants are to have low VOC content limits.
 - .2 Use materials as received from manufacturers, without additives or adulterations. Use one manufacturer's Product for each kind of Product specified.
- .2 Sealant **Type A**: ASTM C920, Type S, Grade NS, Class 25; One-part, non-sag type, silicone sealant, in standard colours selected.
 - .1 'Dowsil CWS' by Dow Consumer Solutions.
 - .2 'Sikasil 305CN' by Sika.
 - .3 'Tremsil 400' by Tremco.
- .3 Sealant **Type B**: ASTM C920, Type S, Grade NS; One-part mildew-resistant silicone, in standard colours selected.
 - .1 'Dowsil 786 Mildew Resistant Silicone Sealant' by Dow Consumer Solutions.
 - .2 'Sikasil GP Mildew Resistant' by Sika.
 - .3 'Tremsil 200 Silicone Sealant' by Tremco Ltd.
- .4 Sealant **Type C**: ASTM C834; Pure acrylic siliconized sealant; in standard white colour (paintable).
 - .1 '950A Siliconized Acrylic Latex Caulk' by Sherwin Williams.
 - .2 'Tremflex 834 Siliconized Sealant' by Tremco Ltd.

2.2 ACCESSORIES

- .1 Primers: Type recommended by material manufacturers for various substrates, primers to prevent staining of adjacent surfaces encountered on project.
- .2 Joint backing: ASTM C1330; Round, solid section, closed cell, skinned surface, soft polyethylene foam gasket stock, compatible with primer and sealant materials, 30 to 50% oversized, Shore A hardness of 20, tensile strength 140 to 200 kPa. Bond breaker type surface.
- .3 Bond breaker: Type recommended by material manufacturers.
- .4 Void filler around the window frames to be one part expanding polyurethane foam.
- .5 Cleaning agents: As recommended by material manufacturer, non-staining, harmless to substrates and adjacent finished surfaces.

2.3 MIXING

- .1 Follow manufacturers instructions on mixing, shelf and pot life.

3 Execution

3.1 EXAMINATION

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.

3.2 INSPECTION

- .1 Verify that joint sealants, backing, and other materials containing hazardous materials have been removed.
- .2 Verify that joint substrates and adjoining materials are structurally sound.
- .3 Verify that joints to be renovated can be satisfactorily repaired with the specified methods and materials.

3.3 PREPARATION

- .1 Remove all existing sealant, loose rust and mill scale by hand cutting, power grinding or wire brushing. Completely remove sealant build up in all joints. Remove any loose particles by blowing joint out with compressed air.
- .2 Clean substrate surfaces so that they are free from caulking, dust, grease, soiling, or extraneous matter, which are detrimental to the adhesion of the sealant.

- .3 Chemically clean all non-porous surfaces, such as aluminum and glass, by solvent wipe and drying with a clean cloth.
- .4 Patch, repair, and smooth minor substrate defects and deficiencies. Clean porous surfaces such as masonry and concrete by mechanical abrading.
- .5 Where existing fasteners are loose, tighten or replace as required.
- .6 Substrate moisture tests:
 - .1 Test for moisture content over areas where sealant is to be applied.
 - .2 If any test registers above 10% allow entire substrate surfaces, within the plane, to dry further before sealant system application. Install temporary drying fans if necessary.
 - .3 After drying of the substrate, re-test employing same criteria.
- .7 Mildew removal: Scrub with solution of TSP and rinse with water, and allow to dry completely.
- .8 Erect scaffolding and rigging required to perform sealant work in accordance with reviewed Shop Drawings.
- .9 Prepare joints to receive sealants to manufacturer's instructions. Ensure that joints are clean and dry and ferrous surfaces are free from rust and oil.
- .10 Clean recesses to receive sealant, to be free of dirt, dust, loose material, oil, grease, form release agents and other substances detrimental to sealant's performance.
 - .1 Remove lacquer or other protective coatings from metal surfaces, without damaging metal finish, using oil-free solvents. Remove rust, mill scale and coatings from ferrous metals by wire brush, grinding or sand blasting.
 - .2 Ensure recess is dry.
 - .3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings. Remove incompatible coatings as required.
- .11 Ensure that all materials in contact with sealant are compatible. Test substrate for adhesion.
- .12 Depth of recess: Maintain depth to $\frac{1}{2}$ joint width up to a maximum of 13 mm and not less than 6 mm at centre of joint. For greater depth, use joint backing under. Where recess is less than specified depth, cut back surface of recess to specified recess depth.
- .13 Install polyethylene backing rod in joints 6 mm or more in width. Roll backing rod into joint. Do not stretch or bend backing rod. Install bond breaker to back of recess.
- .14 Prime sides of recess, in accordance with sealant manufacturer's instructions.
- .15 Condition products for use in accordance with manufacturer's recommendations.

3.4 INSTALLATION

- .1 Apply sealant immediately after adjoining work is in condition to receive such work. Apply sealant in continuous bead using gun with correctly sized nozzle. Use sufficient pressure to evenly fill joint.
- .2 Ensure sealant has full uniform contact with, and adhesion to, side surfaces of recess. Superficial painting with skin bead is not acceptable. Tool sealant to smooth surface, free from ridges, wrinkles, sags, air pockets, embedded impurities, dirt, stains or other defects.
 - .1 At recesses in angular surfaces, finish sealant with flat profile, flush with face of material at each side.
 - .2 At recesses in flush surfaces, finish compound with concave face, flush with face of material at each side.
- .3 Make sealant bead uniform in colour.
- .4 Cure sealants in accordance with sealant manufacturer's instructions. Do not cover up sealants until proper curing has taken place.
- .5 Immediately remove excess compound or droppings which would set up or become difficult to remove from adjacent finished surfaces, using recommended cleaners, as work progresses. Do not use scrapers, chemicals or other tools which could damage finished surfaces. Remove defective sealant.
- .6 Clean recesses and re-apply sealant.
- .7 Remove masking tape immediately after joints have been sealed and tooled.

3.5 CLEANING

- .1 Clean surfaces adjacent to joints, remove sealant smears or other soiling resulting from application of sealants. At metal surfaces, remove residue. Do not mar or damage finishes on materials adjacent to joints. Repair or replace marred or damaged materials.

3.6 SCHEDULE OF LOCATIONS

- .1 Following sealant location schedule is included for convenience and may not be complete. Examine Contract Drawings and other specification sections and determine entire extent of work of this Section. Generally seal following locations:
 - .1 Concrete, masonry, wood and stone to metal.
 - .2 Wood to masonry, concrete and stone.
 - .3 Metal to metal.
 - .4 All dissimilar materials.
 - .5 Where 'sealant' or 'caulking' is indicated on drawings.
- .2 Sealant **Type A**:
 - .1 Interior control joints, except in floors .
 - .2 Door frames, interior and exterior side.

- .3 Protrusions through interior walls and floors, interior and exterior side, except where fire rated seals are required.
- .4 Seal thresholds.

- .3 Sealant **Type B:**
 - .1 Control joints in tiled areas.
 - .2 Between access panels and tile.
 - .3 Between tiles and adjacent materials.

- .4 Sealant **Type C:**
 - .1 Perimeter of kitchen counters.
 - .2 Perimeter of interior windows.
 - .3 Perimeter of firehose cabinets and garbage/linen chutes.
 - .4 Junction between drywall and masonry.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

.1 Labour, Products, equipment and services necessary for the metal doors and frames work in accordance with the Contract Documents.

1.2 **REFERENCES**

.1 ASTM A653/A653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.

.2 ASTM A568/A568M, Specification for General Requirements for Steel, Carbon and High-Strength Low-Alloy, Hot-Rolled Sheet and Cold-Rolled Sheet.

.3 ASTM E90, Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.

.4 CAN/CGSB-1.198, Cementitious Primer, (for Galvanized Surfaces).

.5 CAN/CGSB-12.12-M, Plastic Safety Glazing.

.6 CGSB 41-GP-19Ma, Rigid Vinyl Extrusions for Windows and Doors.

.7 CSA W47.1, Certification of Companies for Fusion Welding of Steel Structures.

.8 CSA W59-M, Welded Steel Construction (Metal Arc Welding).

.9 CSDMA, Canadian Steel Door Manufacturer's Association.

1.3 **SUBMITTALS**

.1 Product data: Submit manufacturer's Product data in accordance with Section 01 00 00 indicating door and frame construction.

.2 Shop drawings:

.1 Submit shop drawings in accordance with Section 01 00 00 for each type of door and frame indicating:

.1 Thickness and type of steel.

.2 Thickness and type of core.

.3 Thickness and type of metal facing on edges of door and method of fastening.

.4 Location of mortises, reinforcement, anchorages, joining, welding, sleeving, exposed fasteners, openings and arrangement for hardware.

.2 Include schedule identifying each unit with door marks and numbers relating to numbering on Contract Drawings and in door schedule. Indicate doors and frames to be fire rated.

1.4 **QUALITY ASSURANCE**

- .1 Perform work in accordance with requirements by a member of the Canadian Steel Door Manufacturer's Association (CSDMA).

2 Products

2.1 **ACCEPTABLE MANUFACTURERS**

- .1 Daybar Industries Limited
- .2 Fleming Doors Products.
- .3 Steel-Craft Door Products Ltd.

2.2 **MATERIALS**

- .1 General:
 - .1 All materials under work of this Section, including but not limited to, primers are to have low VOC content limits.
 - .2 Steel: ASTM A568/A568M, Class 1; Commercial grade steel, hot dip galvanized to ASTM A653/A653M, ZF120 galvanized coating.
 - .3 Minimum base steel thickness:

.1	Frames	1.6 mm
.2	Typical doors	1.6 mm
.3	Lock/strike reinforcements	1.6 mm
.4	Hinge reinforcements	2.7 mm
.5	All other reinforcement	1.6 mm
.6	Top and bottom channels	1.2 mm
.7	Glazing stops	0.9 mm
.8	Guard boxes	0.9 mm
.9	Jamb spreaders	0.9 mm
 - .4 Top caps and thermal breaks: CGSB 41-GP-19Ma; Rigid PVC extrusions.
 - .5 Primer: CAN/CGSB 1.198.
 - .6 Core material:
 - .1 Interior doors: Mineral fibre insulation with a minimum face density of 24 kg/m³ (1.5 lbs/ft³).
 - .7 Screws: Stainless steel screws with countersunk flat head.
 - .8 Door silencers: Type 6-180, black neoprene.

- .9 Frame anchors:
 - .1 Frames in masonry: 1.2 mm minimum, adjustable T-strap jamb anchors.
 - .2 Frames in steel stud partitions: 0.9 mm minimum steel anchors of suitable design securely welded inside each jamb.
- .10 Floor anchors: 1.6 mm minimum adjustable floor clip angles with 2 holes for anchorage to floor.
- .11 Vision panels: CAN/CGSB-12.12, cell cast acrylic, light transmission value 92%. Sizes and shapes as indicated on Drawings; 'Plexiglas G' by Rohm & Haas Company Incorporated. Colours to later selection of Consultant.

2.3 FABRICATION

- .1 General
 - .1 Fabricate doors and frames in accordance with reviewed shop drawings.
 - .2 Welding: CSA W59-M to produce a finished unit with no visible seams or joints, square, true and free of distortion.
 - .3 Welding: Continuous unless specified otherwise. Execute welding by a firm fully acceptable to the Canadian Welding Bureau to requirements of CSA W47.1.
 - .4 Form profiles accurately to details shown on Contract Drawings.
 - .5 Ream and remove burrs from drilled and punched holes.
 - .6 Grind welded corners and joints to a flat plane and fill with metallic filler and sand to a uniform smooth finish. Apply one coat of primer.
 - .7 Provide weather strip for exterior doors in accordance with Section 08 70 00 and door manufacturer.
 - .8 Unless otherwise indicated, overall door thickness to be 45 mm.
- .2 Frames:
 - .1 Fabricate frames of welded construction. Cut mitres and joints accurately and weld continuously on inside of frame profile.
 - .2 Construct large frame sections with provision for on Site assembly to suit Site conditions.
 - .3 Blank, reinforce, drill and tap frames for mortised, templated hardware. Protect mortised cut-outs with guard boxes.
 - .4 Reinforce frames where required for surface mounted hardware.
 - .5 Reinforce frames over 1200 mm wide with roll formed steel channels or hollow structural sections specified in Section 05 50 00 and as indicated on drawings..
 - .6 Prepare each door opening for single stud rubber door silencers, 3 for single door openings located in strike jamb, and 2 for double door openings located in head.
 - .7 Install 2 channel or angle spreaders per frame, to ensure correct frame alignment. Install stiffener plates or spreaders between frame trim where required, to prevent bending of trim and to maintain alignment when setting in place.

- .8 Form channel glazing stops minimum 16 mm height, accurately cut, mitred, fitted and fastened to frame sections with stainless steel counter-sunk, flat head screws spaced at maximum 450 mm throughout and 50 mm from each end.
- .3 Anchorage:
 - .1 Anchor units to floor and wall construction. Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb, minimum number of anchors for each jamb:
 - .1 Frames up to 2285 mm 3 anchors.
 - .2 Frames from 2285 mm to 2440 mm 4 anchors.
 - .2 Where frames are to be set in masonry or concrete, supply adjustable anchors to trade installing frame.
 - .3 Fabricate frames for installation in steel stud partitions with steel anchors of suitable design, minimum number of anchors for each jamb :
 - .1 Frames up to 2285 mm height 4 anchors.
 - .2 Frames 2285 mm to 2440 mm 5 anchors.
- .4 General Door Requirements:
 - .1 Hollow steel construction, flush swing type, of sizes to conform to details, schedules and reviewed shop drawings with provisions for cut-outs for glass and grilles and reinforced to receive hardware fastenings.
 - .2 Blank, reinforce, drill and tap doors for mortised, templated hardware. Where required, reinforce doors for surface mounted hardware and door closers.
 - .3 Reinforce oversized doors with steel channels and plates specified in Section 05 50 00 and as indicated on drawings.
 - .4 Where openings are required, form integral cut-outs with framing, glass stop moldings and division bars.
 - .5 Bevel both stiles of single doors 1 in 16.
- .5 Interior Doors:
 - .1 Supply and install inverted, recessed, fully welded channels at top and bottom of doors.
 - .2 Fabricate doors with joints between front and back panels meeting on stile edges. Make joints continuously welded for entire height of door. After welding has been completed, grind joints smooth to match metal. Ensure that no filler is used in joints.
 - .3 Fill hollow space within door and vertical stiffeners from top to bottom with mineral fibre batt insulation.

3 Execution

3.1 **EXAMINATION**

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.

3.2 HOLLOW METAL DOOR AND FRAME INSTALLATION

- .1 Install hollow metal doors and frames in accordance with reviewed shop drawings, manufacturer's written instructions and to meet CSDMA requirements.
- .2 Install hollow metal doors and frames plumb, square, level, secure, and at correct elevation.
- .3 Install doors clear of floor finishes, and with the correct rebate opening for the door installation. Install door silencers.
- .4 Secure anchorages and connections to adjacent construction. Brace frames rigidly in position while building-in. Remove temporary steel shipping jamb spreaders. Install wood spreaders at third points of frame rebate height to maintain frame width. Supply and install vertical supports as indicated on drawings for openings over 1200 mm in width. Remove wood spreaders after frames have been built-in.
- .5 Allow for structural deflection and prevent structural loads from being transmitted to hollow metal frames.
- .6 Touch-up areas where galvanized coating has been removed or damaged with primer.

3.3 ADJUSTING AND CLEANING

- .1 Adjust doors for smooth and balanced door movement.
- .2 Clean doors, frames, windows and screens.

END OF SECTION

-
- 1 General
- 1.1 **SECTION INCLUDES**
- .1 Labour, Products, equipment and services necessary for the plastic faced wood doors work in accordance with the Contract Documents.
- 1.2 **REFERENCES**
- .1 ASTM D4060, Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser.
- .2 ASTM D4226, Standard Test Methods for Impact Resistance of Rigid Poly(Vinyl Chloride) (PVC) Building Products.
- .3 Architectural Woodwork Standards (AWS) - Quality Standards for Architectural Woodwork.
- .4 CSA O112 Series, Wood Adhesives.
- 1.3 **SUBMITTALS**
- .1 Shop Drawings: Submit Shop Drawings of plastic faced wood doors in accordance with Section 01 00 00 indicating detail thicknesses, core construction, face finish, door sizes, quantities, fastenings and finishes.
- .2 Samples: Submit the following samples in accordance with Section 01 00 00:
- .1 Two 300 x 300 mm door samples for each type of finish, edge wrapping and cut-a-way corners showing construction and materials.
- 1.4 **QUALITY ASSURANCE**
- .1 Perform work in accordance with requirements of AWS, Quality Standards for Architectural Woodwork, Premium Grade, except as indicated otherwise.
- 1.5 **DELIVERY, STORAGE, AND HANDLING**
- .1 Deliver, store, and handle wood doors in accordance with the AWS Quality Standards amended as follows:
- .1 Wrap wood doors individually in protective wrapping for shipment and Site storage.
- .2 Handle wood doors carefully to prevent damage; replace damaged doors.
- .3 Store doors flat on a dry, level surface. Ventilate and maintain recommended relative humidity before, during and after installation.

1.6 **EXTENDED WARRANTY**

- .1 Submit an extended warranty for plastic faced wood door work in accordance with General Conditions, except that warranty period is extended to 5 years from date of Substantial Performance of the Work.
 - .1 Warrant against warpage, ghosting of core lines, delamination, sag and other defects. Warranty shall include hanging, finishing and complete replacement cost of defective doors.
 - .2 Coverage: Complete replacement including affected adjacent work.

2 Products

2.1 **ACCEPTABLE MANUFACTURERS**

- .1 C/S Group.
- .2 Or approved alternative.

2.2 **MATERIALS**

- .1 General:
 - .1 All materials under work of this Section, including but not limited to, adhesives are to have low VOC content limits.
 - .2 Adhesives - Urea-formaldehyde-free glues.
- .2 Solid core doors (non-fire rated):
 - .1 Core: Solid core with minimum 39 lb/ft³ density, with interior stiles and rails bonded, urea formaldehyde free. Tops and bottom to be factory sealed.
 - .2 Door edges: Field-replaceable door edges with 6 mm radius without the use of fasteners as follows:
 - .1 Acrovyn: Rounded, fixed 'Acrovyn' door edges to match door facing colour and texture.
 - .2 Stainless steel edge: 0.8 mm thick stainless steel, No. 4 finish.
 - .3 Door facing: 1.02 mm thick, impact resistant, PVC-free sheet, 'Acrovyn' in texture and colour as selected by the Consultant. Facing to provide the following:
 - .1 Face veneer wear index: Abrasion resistance testing to ASTM D4060; 28,000 cycles to prove out resistant to scuffing and scratching.
 - .2 Face veneer impact resistance: ASTM D4226; 99.08 kg/cm³ to confirm impact resistance of face finish.
 - .4 Panel design: Flush door design.
- .3 Adhesive:
 - .1 Crossbanding: CSA O112 Series, Type II, urea formaldehyde free.
 - .2 Door faces: CSA O112 Series, Type I, urea formaldehyde free.

- .4 Sliding door hardware: Wall mounted, sliding door hardware fabricated from aluminum and consisting of, but not limited to the following components: track, fascia, end caps, ball bearing carrier, mounting plate, door stop, floor guide and fasteners; 'Sliding Door Hardware - Wall Mount' by Knape & Vogt or approved alternative.
- .5 Door frames: Existing hollow metal door frames.

2.3 **FABRICATION**

- .1 Fabricate doors to sizes indicated on Drawings.
- .2 Fabricate doors square, true, and free from distortion waves, ridges or core ghost lines. Factory machine doors for finish hardware and flooring.
- .3 Fabricate doors using hot press construction technology. Bond stiles and rails to core using adhesive. Sand for uniform thickness. Laminate door facing and trim, to assembled core in hot press.
- .4 Cut and bevel stile edges as follows:
 - .1 Lock side: 3 mm in 50 mm.
 - .2 Hinge side: 1.5 mm in 50 mm.
- .5 Finish wood doors in factory and deliver to site ready for hanging.

3 Execution

3.1 **EXAMINATION**

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.

3.2 **INSTALLATION**

- .1 Install doors plumb, rigid, square, clear of floor finishes, and with correct rebate opening for door installation.
- .2 Conform to requirements of AWS Quality Standard, for wood door installation.
- .3 Drill pilot holes for screws and bolts using templates provided by hardware manufacturer.
- .4 Exercise caution when drilling pilot holes and installing hinges so that pilot holes are not over drilled and screws are not over tensioned. Follow manufacturer's installation instructions.

- .5 Reseal exposed tops and bottom rails of any doors that required site alteration with an approved wood sealer.

3.3 **ADJUSTING AND CLEANING**

- .1 Replace the following wood doors:
 - .1 Warped more than 6 mm, measured at any point on door, relative to perfectly flat surface.
 - .2 Core telegraphing visible at 1500 mm distance, under final Site lighting conditions.
- .2 Adjust doors for smooth and balanced door movement.

END OF SECTION

- 1 General
- 1.1 **SECTION INCLUDES**
 - .1 Labour, Products, equipment and services necessary for finish hardware work in accordance with the Contract Documents.
- 1.2 **REFERENCES**
 - .1 BHMA, Builders Hardware Manufacturing Association.
 - .2 NFPA 80, Standard for Fire Doors and Other Opening Protectives.
- 1.3 **SUBMITTALS**
 - .1 Product data: Submit manufacturer's Product data in accordance with Section 01 00 00 indicating compliance with reference standards, transportation, storage, handling and installation requirements.
 - .2 Shop Drawings:
 - .1 Submit Shop Drawings and 3 complete hardware lists in accordance with Section 01 00 00 indicating:
 - .1 Door locations, sizes, hardware manufacturer's catalogue numbers, finish symbols and quantities required.
 - .2 Locations and mounting heights of each type of hardware.
 - .2 Supply templates and required information to door and frame manufacturer to enable accurate sizes, locations of cut-outs and reinforcement for hardware.
 - .3 Submit templates to required trade to arrange for provisions for accurate setting and fitting of hardware.
 - .3 Samples:
 - .1 Submit 2 samples in accordance with Section 01 00 00 of each item that is different from hardware specified and include manufacturer's parts lists and installation instructions.
 - .2 Submit hardware component samples illustrating style, colour and finish. Tag samples identifying applicable Specification article number, brand name and number, finish, building location, date and catalogue number.
 - .3 Do not order hardware until samples have been accepted. Submit new samples to replace rejected samples. Supply hardware and finishes identical to each accepted sample.
 - .4 Closeout submittals:
 - .1 Submit the following in accordance with Section 01 00 00 for each Product for incorporation into Operation and Maintenance Manual:
 - .1 Maintenance data.
 - .2 Operating instructions and safety precautions.
 - .3 Parts list with name and address of supplier.
 - .4 Lubrication schedule and type of lubricant recommended.

- .5 Keys, tools and special devices.
- .6 Inspection procedures related to preventive maintenance.

1.4 **QUALITY ASSURANCE**

- .1 General:
 - .1 Manufacturers: Companies specializing in manufacturing door hardware and registered with BHMA.
 - .2 Hardware supplier: Company specializing in supplying commercial door hardware and acceptable to manufacturer.
- .2 Certifications:
 - .1 Employ an Architectural Hardware Consultant to inspect completed installation and certify that hardware has been installed in accordance with manufacturer's printed instructions, Authorities having Jurisdiction and as specified.
 - .2 Submit manufacturer's certificate that finish hardware and fire rated hardware meets specified requirements.

1.5 **DELIVERY, STORAGE, AND HANDLING**

- .1 Be responsible for packaging of hardware, on a set by set basis. As material is received from various manufacturers identify it to correspond to Hardware List symbols.
- .2 Label packages legibly, indicating manufacturer's number, types, sizes, opening number and Hardware List reference number. Wrap hardware and include in package, screws, bolts and fastening necessary for correct installation. If hardware package is not complete, pay additional charges incurred by installer.
- .3 Deliver hardware to Site packaged, labelled and cross-referenced to hardware list for each item and its scheduled installation location.
- .4 Accept Products of this Section on Site and ensure that each item is undamaged.
- .5 Catalogue and store hardware in secure area.

2 **Products**

2.1 **GENERAL**

- .1 Provide hardware schedule to Consultant for approval indicating products, materials and finishes. Do not order products until schedule has been approved by Consultant.

- .2 Carefully check and verify Hardware List against Contract Drawings to ensure that hardware listed can be used as specified. Inform Consultant of concerns regarding quality, quantity, operation or function of hardware selected:
 - .1 Verify hand of doors, examine details on Contract Drawings and at Site to ensure hardware supplied can be correctly installed and is correct for work as constructed.
 - .2 Select hardware in accordance with applicable codes and regulations and to approval of local Fire Marshal.
 - .3 Replace and pay for defective hardware including hardware which was incorrectly selected, and remedial and installation costs.
- .3 Ensure that hardware selected will function correctly, meets Contract requirements and Ontario Building Code and authorities having jurisdiction.
- .4 Ensure that each hardware item is of same type, design and by same manufacturer.
- .5 Manufacturer's names or trade marks are not permitted on exposed surfaces of hardware.
- .6 Include in packing slip a list of parts, name of supplier and door number in which lock is to be installed.
- .7 Hardware for fire rated and labelled door and frame assemblies: ULC listed or as accepted by authorities having jurisdiction..

2.2 ACCESSORIES

- .1 Items to be attached to masonry or concrete with expandable shields, lag screws, bolts or other fastening devices as required. Exposed screws: Stainless steel, Phillips or Robertson heads.

2.3 FINISHES

- .1 Metal finishes: Free from defects, clean, unstained and of a uniform colour for each type of finish required. Exposed surfaces and anchors: Specified finish symbol of item.

3 Execution

3.1 EXAMINATION

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.

3.2 INSTALLATION

- .1 Install hardware in accordance with reviewed Shop Drawings, manufacturer's installation instructions, and applicable Codes and regulations.
- .2 Install hardware in accordance with hardware templates.
- .3 Adjust fixed and operable hardware for correct clearances and function.
- .4 Mount hardware measured from finished floor to centre of hardware, unless indicated otherwise or required by Code:
 - .1 Top hinge: 250 mm from head of door to top.
 - .2 Bottom hinge: 265 mm from finished floor to bottom of hinge.
 - .3 Intermediate hinge: Equal distance between top and bottom hinge.
 - .4 Locksets, latchsets: 1000 mm.
 - .5 Panic device crossbar: 1000 mm.
 - .6 Push plates: 1100 mm to bottom of plates.
 - .7 Guard bars: 1100 mm.
 - .8 Door pulls: 1100 mm to bottom of pulls.
 - .9 Blank strike: 1450 mm.
 - .10 Blank fronts: 1450 mm.
- .5 Include for supply and installation of wiring for electric strikes from electrical junction box to electric strike hardware.
- .6 Locate door stops to contact doors 75 mm from latch edge.
- .7 Install hardware and trim square and plumb to doors.
- .8 Replace wrappings for hardware provided by manufacturer after installation.
- .9 Safeguard keys to keep them out of unauthorized hands, tag them with door number, and deliver them to person designated by Consultant at building completion.

3.3 FIELD QUALITY CONTROL

- .1 Have hardware inspected after installation by hardware supplier's representative, obtain certification in writing that hardware has been supplied and installed in accordance with Specifications and hardware manufacturer's instructions and is functioning correctly.
- .2 Inspect fire rated openings to ensure they are installed in compliance with NFPA 80 requirements and Authorities having Jurisdiction.
- .3 Test access control system and electrified hardware devices for proper operation. Verify electric door release hardware operates properly upon activation of fire alarm system.

3.4 **ADJUSTING**

- .1 Verify under work of this Section, that installed hardware functions properly.
- .2 Adjust hardware so that latches and locks operate smoothly and without binding, and closers act positively with the least possible resistance in use. Lubricate hardware if required by manufacturer's instructions.
- .3 Adjust doors with self closing devices or automatic closing devices for proper operation after the HVAC system is balanced and adjusted. Verify spring power of non sized door closers is properly adjusted.

3.5 **CLEANING**

- .1 Remove wrappings at completion of the Project and clean hardware in accordance with manufacturer's instructions.

3.6 **HARDWARE GROUPS/SCHEDULE**

- .1 Hardware groups/schedule: To follow.

END OF SECTION

21509.F03 - Seven Oaks - Pot Wash And Servery Reno

HARDWARE GROUP NO. 01

For use on Door #(s):
B46C

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4 NRP	630	IVE
1	EA	ELEC CLASSROOM LOCK	CO-100-CY-70-KP-RHO-LD 4B BATTERY OPERATED	626	SCE
1	EA	PERMANENT CYLINDER	BY OWNER		
1	EA	SURFACE CLOSER	4040XP REG	689	LCN
1	EA	ARMOR PLATE	8400 36" X 1 1/2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	626	IVE

HARDWARE GROUP NO. 02

For use on Door #(s):
478B

Provide each DA door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	PIVOT SET	7255 SET	626	IVE
1	EA	KEYPAD DEADBOLT	BE365N PLY 12-287 10-092 9VDC	626	SCH
2	EA	PUSH PLATE	8200 4" X 16"	630	IVE
1	EA	CONCEALED CLOSER	6033 WMS	689	LCN
2	EA	ARMOR PLATE	8400 36" X 1" LDW B-CS	630	IVE
2	EA	FLOOR STOP	FS439	682	IVE

End of Schedule

21509.F04 - Seven Oaks - Sliding Doors

Hardware Group SO-01

42 Sliding Doors

RESIDENT ROOM / RESIDENT WASHROOM

Each Assembly to have:

1 ea Track	C-104 x length		KNC
2 ea Hangers	C-911		KNC
2 ea Stop	C-101HD		KNC
1 ea Floor Guide	C-913		KNC
1 ea Door Channel	C-914 x length		KNC
1 ea Pull	CBH7018 #3-3 MTG	630	CBH
1 ea Flush Pull	H485	626	STM

End of Schedule

-
- 1 General
- 1.1 **SECTION INCLUDES**
- .1 Design, labour, Products, tool, equipment and services necessary for automatic door equipment work in accordance with the Contract Documents.
- 1.2 **REFERENCES**
- .1 ANSI/BHMA A156.19, Power Assist and Low-Energy Power-Operated Doors.
- 1.3 **DESIGN REQUIREMENTS**
- .1 Design handicap door system comprising of low energy power operator with optional push and go door system as defined in ANSI/BHMA A156.19.
- .2 Design system operator to activate if one push button from either side of door is pushed. Actuated door shall open slowly to back check (80°) in 3 to 6 seconds and to full open position in 4 to 7 seconds. Door shall remain open for period set to suit requirements (period of 5 to 30 seconds). After time delay door shall close by spring in door operator from 90° to 10° in 3 to 6 seconds from 10° to fully closed in 1-1/2 to 2 seconds.
- 1.4 **SUBMITTALS**
- .1 Product data: Submit duplicate copies of manufacturer's Product data in accordance with Section 01 00 00 indicating performance criteria, compliance with appropriate reference standard(s), characteristics, limitations, trouble-shooting protocol, transportation, storage, handling and installation requirements.
- .2 Shop drawings: Submit shop drawings in accordance with Section 01 00 00 indicating all connections, attachments, reinforcing, anchorage and location of exposed fastenings.
- .3 Extended warranty: Submit extended warranty signed and registered by the manufacturer providing the warranty in the name of the Owner for the timeframe and coverage specified in this Section.
- 1.5 **EXTENDED WARRANTY**
- .1 Submit a extended warranty for automatic door equipment in accordance with General Conditions, except that warranty period is extended to 2 years.
- .1 Warrant against failure to meet design criteria and requirements.
- .2 Coverage: Complete replacement including affected adjacent Work.

2 Products

2.1 **ACCEPTABLE MANUFACTURER(S) AND SYSTEM(S)**

- .1 Regular Duty, Interior Operator: Design is based on low energy, electro-mechanical operator. Operator to be as manufactured by one of the following:
 - .1 Navig-Aider 50 by Besam of Canada.
 - .2 Magic Access by Stanley Canada Inc.
 - .3 Or approved alternative by Allegion.
- .2 Door operating equipment shall be complete with electro mechanical motor gear box. Provide 3 position (off-on) switch.

2.2 **REQUIREMENTS**

- .1 Functional Requirements:
 - .1 Equipment shall be designed to operate swing doors up to weight of 100 kg.
 - .2 Opening Speed:
 - .1 Door shall be field adjusted to back check as required in Table 1 of ANSI/BHMA A156.19.
 - .2 Opening speed to fully open shall be 4 seconds or longer.
 - .2 Hold Open: Door shall be field adjusted to remain fully open for not less than 5 seconds or more than 30 seconds.
 - .3 Closing Speed:
 - .1 Doors shall be field adjusted to close 90° to 10° in 3 seconds or longer as required in Table 1 of ANSI/BHMA A156.19.
 - .2 Doors shall close from 10° to fully closed in not less than 1.5 seconds.
 - .3 Force required to prevent door from opening or closing shall not exceed 7 kg applied 25 mm from latch edge of door at any point in opening or closing cycle.
 - .4 During power failure, doors shall open with manual pressure not exceeding 11.3 kg at point 25 mm from latch edge of door.
 - .5 Doors shall be equipped with signs visible from either side, instructing user as to operation and function of door.
 - .4 Requirements:
 - .1 Provide header complete with full housing, finish shall match door frame finish.
 - .2 Locations of automatic door operators to conform to requirements of the Ontario Building Code (OBC).
 - .3 Operator shall be activated by 150 mm diameter stainless steel push button switches on either sides as indicated.
 - .4 Switches shall bear universal handicap logo visible to all types of traffic.

3 Execution

3.1 **EXAMINATION**

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.

3.2 **INSTALLATION**

- .1 Install automatic door operators, controls and accessories for doors indicated in accordance with reviewed shop drawings and manufacturer written instructions.
- .2 Installation of automatic door operators to be in accordance with requirements of the Ontario Building Code (OBC).
- .3 Doors shall operate manually as though equipped with manual door closers, without damage to automatic door components, in event of power failure or in event of power termination.
- .4 Power supply to each door operator and wiring shall be provided by Division 26 - Electrical. Make connections at operators and at control panel and supply and install each electrical work between operators and activating controls. Comply with requirements of Division 26 - Electrical. All wiring shall be concealed and where exposed shall be run in conduit. Location of exposed wiring shall be subject to Consultant's approval.

3.3 **ADJUSTMENT AND CLEANING**

- .1 Test and adjust operators and controls smooth and proper operation.
- .2 Upon completion of Work of this Section, remove from Site all debris, equipment and excess material resulting from Work of this Section.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

.1 Design, labour, Products, equipment and services necessary for gypsum board work.

1.2 **REFERENCES**

.1 ASTM A653/A653M, Specification for Steel Sheet, Zinc-coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.

.2 ASTM C475, Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.

.3 ASTM C645, Specification for Nonstructural Steel Framing Members.

.4 ASTM C665, Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.

.5 ASTM C754, Specification for Steel Framing Members to Receive Screw-Attached Gypsum Board.

.6 ASTM C834, Standard Specification for Latex Sealants.

.7 ASTM C840, Specification for Application and Finishing of Gypsum Board.

.8 ASTM C1002, Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.

.9 ASTM C1178, Specification for Glass Mat Water-Resistant Gypsum Backing Board.

.10 ASTM C1278, Specification for Fiber-Reinforced Gypsum Panel.

.11 ASTM C1396, Specification for Gypsum Board.

.12 ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials.

1.3 **DESIGN REQUIREMENTS**

.1 Design ceiling suspension system in accordance with manufacturer's printed directions and ASTM C754.

.2 Design ceiling system for adequate support of electrical fixtures as required by the current bulletin of the Electrical Safety Authority.

- .3 Design hanger anchor and entire suspension system static loading not to exceed 25% of their ultimate capacity including lighting fixture dead loads.
- .4 Design suspension system to support weight of mechanical and electrical items such as air handling boots and lighting fixtures, and with adequate support to allow rotation/relocation of light fixtures.
- .5 Design subframing as necessary to accommodate, and to circumvent, conflicts and interferences where ducts or other equipment prevent the regular spacing of hangers.
- .6 Design wall framing system for wall assemblies with a height greater than 3000 mm.

1.4 REGULATORY REQUIREMENTS

- 1. Provide fire separations and fire protection exactly as specified in test design specification that validates the specified rating. Verify that work specified in other Sections, as a part of the entire assembly, meets applicable validating test design specification.

1.5 SUBMITTALS

- .1 Product data:
 - .1 Submit copies of manufacturer's Product data in accordance with Section 01 00 00 indicating:
 - .1 Performance criteria, compliance with appropriate reference standard, characteristics, and limitations.
 - .2 Product transportation, storage, handling and installation requirements.
 - .2 Shop Drawings:
 - .1 Submit Shop Drawings in accordance with Section 01 00 00 indicating:
 - .1 Wall assemblies, suspension systems, adjacent construction, elevations, sections and details, dimensions, thickness, finishes and relationship to adjacent construction.
 - .2 Framing and blocking for items being supported of wall systems.
 - .3 Certifications: Submit written certification stating that suspended ceiling system is designed for adequate support of electrical fixtures as required by the current bulletin of the Electrical Safety Authority.

1.6 QUALITY ASSURANCE

- .1 Qualifications: Execute the work of this Section by skilled, qualified, and experienced workers trained in the installation of the work of this Section.

- .2 Retain a Professional Engineer, licensed in Province of Ontario, with experience in work of comparable complexity and scope, to perform following services as part of work of this Section:
 - .1 Design of wall systems with height greater than 3000 mm.
 - .2 Design of suspended gypsum board assemblies.
 - .3 Review, stamp, and sign Shop Drawings and design calculations.
 - .4 Conduct shop and on-site inspections, prepare and submit written inspection reports verifying that this part of Work is in accordance with Contract Documents and reviewed Shop Drawings.

1.7 SITE CONDITIONS

- .1 Do not begin work of this Section until:
 - .1 Mechanical and electrical work above the ceiling is complete.
 - .2 Substrate and ambient temperature is above 15°C.
 - .3 Relative humidity is below 80 %.
 - .4 Ventilation is adequate to remove excess moisture.
- .2 Install temporary protection and facilities to maintain Product manufacturer's, and above specification, environmental requirements 24 h before, during, and 24 h after installation.

2 Products

2.1 MATERIALS

- .1 General: All materials under work of this Section, including but not limited to, sealants, adhesives, and primers are to have low VOC content limits.
- .2 Steel framing: ASTM C754; ASTM A653/A653-M, Z275; cold rolled, galvanized steel sheet.
 - .1 Bailey Metal Products Limited
 - .2 Corus Metal Profiles
- .3 Steel studs and track runners: ASTM C645; Galvanized steel studs and runners, 32 mm wide x depth as indicated on Contract Drawings. Formed from galvanized steel sheet, thicknesses as follows:
 - .1 Studs less than 3000 mm: Minimum 0.53 mm (25 ga.).
 - .2 Studs greater than 3000 mm and non-standard assemblies: Minimum 0.91 mm (20 ga.), unless stud thickness of greater thickness is required to accommodate intended loading, spans, or conditions.
 - .3 Track runners and ancillary components to match stud thickness.
- .4 Main carrying channels: ASTM C645; Formed from galvanized steel sheet, 38 x 19 mm cold rolled, channels.
- .5 Resilient channel: ASTM C645; 0.5 mm thick galvanized metal, 57 mm wide x 12 mm deep for walls and ceiling to reduce sound transmission.

- .6 Furring channels: ASTM C645; Formed from galvanized steel sheet, 22 mm winged flange type, cold rolled.
- .7 Furring channels (hat type): ASTM C645; 0.5 mm base steel thickness, galvanized. 70 mm wide x 22 mm deep hat shaped channel.
- .8 Heavy duty furring channels: ASTM C645; 0.9 mm steel thickness, galvanized hat shaped channel with a wider and deeper size as required by manufacturers.
- .9 Hanger wires: 4.1 mm minimum diameter galvanized pencil rod.
- .10 Tie wire: 1.6 mm thick minimum diameter, soft annealed, galvanized steel wire.
- .11 Corner bead, casing bead, and special shapes: Formed from 0.6 mm thick minimum, galvanized steel sheet, designed to be concealed by joint compound.
- .12 Deflection track: ASTM C 645 top runner with 50.8-mm- deep flanges, in thickness indicated for studs and in width to accommodate depth of studs.
- .13 Control joint strip: Roll formed from galvanized steel sheet, with a tape protected recess, 6 mm wide x 11 mm deep.
- .14 Screw fasteners: ASTM C1002 Type S; Corrosion resistant.
- .15 Concrete anchors: tie wire sleeve anchors, 'Redi-Drive Anchors' by ITW Red Head or approved alternative.
- .16 Acoustic/Fire insulation: ASTM C665, Paperless, semi-rigid, spun stone wool fibre mats, of thickness as indicated on Contract Drawings, 'MinWool SAFB' by Johns Manville, 'SAFB Thermafiber' by Owens Corning Inc. or 'Rockwool AFB' by Rockwool.
- .17 Sealants:
 - .1 Acoustic sealant (non-rated): Non-hardening acoustic sealant for use at non-rated assemblies, ASTM C834; Acrylic, mould resistant sealant, paintable. 'Smoke and Acoustic Sealant CP506' by Hilti or approved alternative.
 - .2 Sealant (fire-rated): Non-hardening sealant for use at fire-rated assemblies: ASTM E84; Acrylic based firestop sealant, colour: red or white as selected by Consultant. 'Flexible Firestop Sealant CP606' by Hilti or approved alternative.
 - .3 Standard sealants: In accordance with Section 07 92 00.
- .18 Gypsum board: ASTM C1396; gypsum board 12.7 mm thick of maximum practical lengths to minimize end joints, unless indicated otherwise. Furnish Board by Certainteed Gypsum Canada, CGC Inc., or Georgia-Pacific Canada LP.
- .19 Fire rated gypsum board: ASTM C1396; gypsum board 15.9 mm thick of maximum practical lengths to minimize end joints, unless indicated otherwise. Furnish Type X Board by Certainteed Gypsum Canada, CGC Inc., or Georgia-Pacific Canada LP.

- .20 Moisture and mould resistant board: 12.7 mm thick of maximum practical lengths to minimize end joints, unless indicated otherwise; 'M2Tech Moisture and Mould Resistant' by Certainteed Gypsum Canada, 'Sheetrock Mold Tough' by CGC Inc. or 'DensArmor Plus High Performance Interior Panel' by Georgia-Pacific Canada LP.
 - .21 Special trim pieces: to include, but not limited to, the following:
 - 1. F reveal: Formed from extruded aluminum alloy 6063 T5. 'FDM-625-75' manufactured by Fry Reglet, Gordon Trims, or approved alternative.
 - 2. L trim: Formed from extruded aluminum alloy 6063 T5. Manufactured by Fry Reglet, Gordon Trims, or approved alternative.
 - 3. J moulding: Formed from extruded aluminum alloy 6063 T5. '1054' manufactured by Fry Reglet, Gordon Trims, or approved alternative.
 - 4. End closure: Formed from extruded aluminum alloy 6063 T5. 'DMEC-200' manufactured by Fry Reglet, Gordon Trims, or approved alternative.
 - 22. Primer: Where indicated by board manufacturer, provide primer as required to achieve finishes as defined in ASTM C840.
 - .23 Joint reinforcing tape: ASTM C475; 50 mm wide x 0.25 mm thick, perforated paper, with chamfered edges.
 - .24 Joint and patching compound: ASTM C475; Asbestos-free, supplied by manufacturer of gypsum board used.
 - .25 Fast setting patching compound: ASTM C475; Asbestos-free, Sheetrock or Durabond by CGC Inc., 'Moisture and Mold Resistant Setting Compound with M2Tech' by Certainteed Gypsum Canada or approved alternative.
 - .26 Access doors: In accordance with Section 10 80 00.
- 3 Execution
- 3.1 **EXAMINATION**
- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.
- 3.2 **SUSPENSION FRAMING**
- .1 Install ceiling systems in accordance with reviewed Shop Drawings and manufacturer's written instructions.
 - .2 Install hanger wires plumb and securely anchored to the building structural framing, independent of walls, pipes, ducts, and metal deck; install additional framing and hangers to bridge interference items.

- .3 Install hanger wires at 1200 mm maximum centres along carrying channels, not less than 25 mm, and not more than 150 mm from channel ends.
- .4 Install additional hangers at lighting fixture and ductwork locations. Do not attach hanger wires to mechanical or electrical equipment. Do not support mechanical and electrical fixtures and fitting on ceiling without the ceiling manufacturer's written acceptance.
- .5 Install main carrying channels transverse to structural framing members. Lap main carrying channels 200 mm minimum at splices and wire each end with two loops and prevent clustering or lining-up of splices.
- .6 Install furring channels at 400 mm o.c., not less than 25 mm, and not more than 150 mm from perimeter walls, at openings, at interruptions in ceiling continuity, and at change in plane. Install furring channels to a tolerance of 3 mm maximum in 3600 mm.
- .7 Install additional main carrying and furring channels to frame and to reinforce openings such as recessed lighting fixtures, access hatches, ceiling grilles, outlet boxes, ventilating outlets and similar items.

3.3 **STEEL STUDS AND FURRING**

- .1 Install steel studs and furring in accordance with reviewed Shop Drawings and manufacturer's written instructions.
- .2 Install steel stud partitions to underside of structure unless indicated otherwise.
- .3 Install track runners at floors, ceilings, and underside of structure; align track runners accurately and secure to structure at 600 mm centres maximum.
- .4 Install double top track runner assembly to prevent the transmission of structural loads to steel studs.
- .5 Install steel studs vertically at 400 mm o.c., unless otherwise indicated, and not more than 50 mm from abutting walls, at openings, and at each side of corners. Install studs securely to track runners.
- .6 Schedule and coordinate steel framing installation with mechanical and electrical services installation.
- .7 Install full height, double studs at door and service openings, fastened together and stiffened back to the structure to prevent vibration when doors close.

- .8 Provide double studs boxed together at all openings, sill, head and jambs and at door jambs, fastened together and stiffened back to the structure to prevent vibration. At each opening exceeding 900 mm in width, double studs shall be 20 ga. extending to structure above, and adequately anchored at each end. Provide steel studs above and below openings spaced at 400 mm oc maximum. All metal stud partitions above doors and screens over 1220 mm wide shall be secured to structure over and reinforced with sway bracing to stabilize walls to prevent lateral movement.
- .9 Erect three studs at corner and intermediate intersections of partitions. Space 50 mm apart and brace together with wired 19 mm channels.
- .10 Stiffen partitions over 2440 mm high or 3000 mm long, or both, with horizontal bracing extended for full length of partitions. Provide one line of bracing in partitions. Space lines to provide equal unbraced panels. Provide bracing for portions of partitions over door openings in partitions over 3000 mm high, and bracing both above and below openings in partitions located no greater than 150 mm from top and bottom of opening, and extending two stud spaces beyond each edge of opening for both doors and windows. Wire tie or weld bracing to studs.
- .11 Frame control joints using back to back double studs at abutting structural elements, at dissimilar backup interface, at dissimilar walls and ceilings, at structural expansion and control joints, at door and other openings, and at 9000 mm maximum spacing in continuous runs. Install control joint strips and secure in place.
- .12 Install additional support framing at openings and cutouts for built-in equipment, upper cabinet support, access panels and similar items.
- .13 Attach to framing adequate steel reinforcing members or an 1.2 mm (18 ga.) steel stud mounted horizontally and notched around furring members to support the load of, and to withstand the withdrawal and shear forces imposed by, items installed upon the work of this Section. Such items include, but are not restricted to, miscellaneous metals, coat hooks, washroom accessories, handrail anchors, rub rails, grab bars, guards, wall-hung cabinets and fitments, shelving, curtain and drape tracks, miscellaneous specialties; Owner supplied equipment; and minor mechanical and electrical work. Heavy mechanical and electrical equipment shall be self-supporting in Divisions 21, 22, 23 and 26.
- .14 Provide for support and incorporation of flush-mounted and recessed mechanical and electrical equipment and fixtures only after consultation and verification of methods with those performing the work of Divisions 21, 22, 23 and 26.
- .15 Install cross bracing in accordance with the steel stud manufacturer's recommendations.

3.4 FIRE RATED ASSEMBLIES

- .1 Install Products in fire rated assemblies in strict accordance with applicable ULC tested and approved designs.

- .2 Stiffen fire rated walls over 3.66 m high, where linear length of wall is greater than 2.44 m between perpendicular wall supports, with diagonal bracing above the ceiling extending perpendicular to wall at a 45° angle to structure above. Locate diagonal bracing at maximum 2.44 m o.c.
- .3 Where double layers of gypsum board are shown, and required for fire rating, screw first layer to studs and furring and laminate the second layer to the first using joint filler as an adhesive. Stagger joints between first and second layers.

3.5 **ACOUSTICAL INSULATION**

- .1 Install acoustic insulation in partitions, between steel studs, and as indicated on Contract Drawings and in accordance with the manufacturer's instructions. Fill stud cavities to full height of partitions and carefully cut and fit acoustic insulation around services and protrusions.

3.6 **ACOUSTICAL SEALANT**

- .1 Install acoustical sealant to acoustically insulated partitions in accordance with the manufacturer's instructions and Contract Drawings.
- .2 Install acoustical sealant under floor runner track, at partition perimeter both sides and at openings, cut-outs, and penetrations, concealed from view in the final installation.
- .3 Install firestop fill material behind fire rated acoustical sealant and provide firestop identification tag.
- .4 Smooth acoustical sealant with trowel prior to skin forming.

3.7 **GYPSUM BOARD**

- .1 Comply with ASTM C840. Install gypsum board in accordance with reviewed Shop Drawings and manufacturer's written instructions.
- .2 Install gypsum board vertically or horizontally, whichever results in fewer end joints. Locate end joints over supporting members.
- .3 Install gypsum board in lightly butted contact at edges and ends and with 1.6 mm maximum open space between boards; do not force gypsum board into place. Do not install imperfect, damaged or damp boards.
- .4 Install gypsum board butting paired tapered edge joints, and mill-cut or field-cut end joints; do not place tapered edges against cut edges or ends.
- .5 Install vertical joints minimum 300 mm from the jamb lines of openings and stagger vertical joints over different studs on opposite sides of partitions.

- .6 Do not locate joints within 200 mm of corners or openings, except where control joints occur at jamb lines or where openings occur adjacent to corners. Where necessary, place a single vertical joint over the centre of wide openings.
- .7 Install gypsum board over concrete and concrete masonry units with adhesive as recommended by gypsum board manufacturer where indicated on Drawings.
- .8 Cut, drill and patch gypsum board as may be necessary to accommodate the work of other trades.
9. Fire Separations:
 1. Construct gypsum board assemblies, where located, in accordance with tested assemblies to obtain required or indicated fire rated assemblies. As a minimum fire separations shall consist of metal framing covered on both sides by fire-rated gypsum board.
 2. Install assemblies tightly to enclosing constructions to maintain integrity of the separations. Install casing beads at all perimeter edges.

3.8 CORNER, CASING BEADS AND TRIM

- .1 Corner reinforcing bead: Install along all external angles, erect plumb, level and with a minimum of joints. Secure with screws at 225 mm o.c. apply filler over flanges flush with nose of the bead and extending at least 75 mm onto surface of board each side of corner. When filler dries, apply a thin coat of topping cement and blend onto adjoining surfaces.
- .2 Casing bead: Install where wallboard butts against a surface having no trim concealing the juncture and where shown on drawings. Erect casing beads plumb or level, with minimum joints, and secure with screws at 300 mm o.c. apply filler over flange flush with bead and extending at least 75 mm onto surface of board. When dry, apply a thin coat of topping cement and blend onto adjoining surfaces.
- .3 Recess channels and trim: Install recess channels and special metal trim where shown. Secure to substrate. Provide casing beads full height on wallboard edges at recess channels and metal trim.

3.9 JOINT TAPING AND FINISHING

- .1 Install reinforcing tape and a minimum of 3 coats of joint compound over gypsum board joints, metal trim and accessories, and screw fasteners in accordance with the gypsum board manufacturer's instructions.
- .2 Fill gaps between ,and any imperfections in, gypsum boards with joint compound, allow to dry, and sand smooth ready for painting.
- .3 Install finished gypsum board work smooth, seamless, plumb, true, flush, and with square, plumb, and neat corners.

- .4 Finish gypsum board in accordance with ASTM C840 to the following grades:
 1. Level 0: No taping, finishing, or accessories required. Use above suspended ceilings and within other concealed spaces, unless the assembly is fire rated, sound rated, sound or smoke controlled, or unless the space serves as an air plenum.
 2. Level 1: At joints and interior angles embed tape in joint compound. Leave surface free of excess joint compound. Tool marks and ridges are acceptable. Use above suspended ceilings and within other concealed spaces if the gypsum board assembly is fire rated, sound rated, sound or smoke controlled, or the space serves as an air plenum.
 3. Level 2: At joints and interior angles embed tape in joint compound with one separate coat of joint compound applied over joints, angles, fastener heads, and accessories. Use for water resistant gypsum board indicated for use as a substrate for ceramic tile.
 4. Level 3: At joints and interior angles embed tape in joint compound with two separate coats of joint compound applied over all joints, angles, fastener heads, and accessories. Apply joint compound smooth and free of tool marks and ridges. Use where heavy grade wall coverings are the final decoration.
 5. Level 4: At joints and interior angles embed tape in joint compound with three separate coats of joint compound applied over all joints, angles, fastener heads, and accessories. Apply joint compound smooth and free of tool marks and ridges. Use for all locations except those indicated for other finish levels.

3.10 ACCESS DOORS

- .1 Install access doors, supplied as part of other parts of the work, in accordance with manufacturer's written instructions.

3.11 SITE TOLERANCES

- .1 Install metal support systems to ensure that, within a tolerance of +3 mm and -1.5 mm for plaster thickness, finish surfaces will be flat within 3 mm under a 3 m straightedge, and with no variation greater than 1.5 mm in any running 300 mm, and that surface planes shall be within 3 mm of dimensioned location.

3.12 WORK IN EXISTING AREAS

- .1 In existing areas, where existing gypsum board work has been demolished and/or damaged and repair work is required, provide new gypsum board finish.
- .2 Thoroughly prepare areas to be repaired. Provide neat, clean and straight cuts.
- .3 Finish all repair work as specified for new work.
- .4 In existing areas where existing openings are to be filled in with gypsum board, provide new gypsum board wall and ceiling construction. Ensure new board faces are flush with faces of abutting existing walls and ceilings.

3.13 **REPAIR**

1. Make good cut-outs for services and other work, fill in defective joints, holes and other depressions with joint compound.

2. Make good defective work, and ensure that surfaces are smooth, evenly textured and within specified tolerances to receive finish treatments.

END OF SECTION

- 1 General
- 1.1 **SECTION INCLUDES**
 - .1 Labour, Products, equipment and services necessary for resilient sheet flooring
Work in accordance with the Contract Documents.
- 1.2 **REFERENCES**
 - .1 ASTM F710, Standard Practice for Preparing Concrete Floors to Receive Resilient
Flooring.
 - .2 ASTM F1516, Standard Practice for Sealing Seams of Resilient Floor Products by
the Heat Weld Method.
 - .3 ASTM F1869, Standard Test Method for Measuring Moisture Vapor Emission Rate of
Concrete Subfloor Using Anhydrous Calcium Chloride.
 - .4 ASTM F 2170, Standard Test Method for Determining Relative Humidity in Concrete
Slabs Using in-situ Probes.
 - .5 CAN/ULC-S102.2-M, Method of Test for Surface Burning Characteristics of Flooring,
Floor Coverings, and Miscellaneous Materials and Assemblies.
 - .6 ISO 717-2, Acoustics - Rating of Sound Insulation in Buildings and of Building
Elements - Part 2: Impact Sound Insulation.
- 1.3 **SUBMITTALS**
 - .1 Product data:
 - .1 Submit copies of manufacturer's Product data in accordance with Section 01
00 00 indicating:
 - .1 Performance criteria, compliance with appropriate reference standard,
characteristics, and limitations.
 - .2 Product transportation, storage, handling and installation
requirements.
 - .2 Shop drawings: Submit shop drawings indicating seam layout and welding
procedures in accordance with Section 01 00 00.
 - .3 Samples:
 - .1 Submit samples in accordance with Section 01 00 00:
 - .1 Submit two 250 x 200 mm samples of each type of sheet material and
colour.

.2 Submit two 100 mm x 100 mm samples of aluminum backed resilient base. Flash cove base samples must be representative of riser height and toe lengths specified, and shall represent one completed inside corner and one completed outside corner, with seams sealed and finished. Produce flash cove base samples in specified flooring materials and selected colours.

.4 Closeout submittals: Submit maintenance and cleaning data for incorporating into Operations and Maintenance Manuals in accordance with Section 01 00 00.

1.4 **QUALITY ASSURANCE**

.1 Installers qualifications (prefabricated flash cove bases): Perform work of this Section by a company that has a minimum of five years proven experience in the installation of prefabricated flash cove bases of a similar size and nature and that is approved by manufacturer. Submit to Consultant, installer's current certificate of approval by the material manufacturer as proof of compliance.

1.5 **SITE CONDITIONS**

.1 Maintain air temperature and structural base temperature at flooring installation area above 20°C for 48 hr before, during and 48 hr after installation.

.2 Store materials for 2 days prior to installation in area of Work to achieve temperature stability.

.3 Do not lay flooring in conditions of high humidity or where exposed to cold drafts. In hot weather, protect from direct sunlight.

.4 Provide adequate ventilation during installation.

1.6 **EXTENDED WARRANTY**

.1 Manufacturer's warranty:

.1 Sheet flooring: Provide flooring manufacturer's warranty naming Owner as beneficiary, covering excessive wear for a period of 5 years from the date Work is certified as Substantially Performed.

.2 Prefabricated flash cove base: Warrant prefabricated flash cove base for lifetime against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Consultant and at no expense to Owner. Defects include but are not limited to punctures through aluminum backing at cove radius provided prefabricated flash cove base was installed professionally in accordance with manufacturer's written specifications.

1.7 **MAINTENANCE**

- .1 Submit extra 5% or to nearest full roll of each colour, pattern and type of flooring material and bases required for maintenance use. Identify each roll. Store where directed. Submit maintenance material in one piece and of same production run as installed materials.

2 Products

2.1 **MATERIALS**

- .1 All materials under Work of this Section, including but not limited to, primers and adhesives are to have low VOC content limits.
- .2 Linoleum sheet flooring (**RSF-#** - resilient sheet flooring):
 - .1 Conforming to ASTM F2034, Type 1, 2.5 mm thick, homogeneous resilient flooring, made from natural ingredients, mixed and calendared onto a natural jute backing.
 - .2 Flame spread: 150 to CAN/ULC-S102.2-M.
 - .3 Smoke developed: 160 to CAN/ULC-S102.2-M.
 - .4 Impact sound reduction: when tested to ISO 717/2, 6 dB.
 - .5 Slip resistance: Static coefficient of slip resistance meets or exceeds 0.6 when tested in accordance with ASTM D2047.
 - .6 Static load limit: 450 pounds per square inch when tested in accordance with ASTM F970.
 - .7 Colours: Refer to drawings.
 - .8 Acceptable products and manufacturers: 'Marmoleum Concrete' by Forbo Flooring or approved alternative.
- .3 RESERVED.
- .4 Cove capping strips (**CC-#**):
 - .1 Provide self-coving PVC capping strip for cove bases. 'Cove Cap C7' by Altro Flooring, 'Cove Cap SCS' by Tarkett or approved alternative.
 - .2 Colours: Refer to drawings.
- .5 Welding rod: type recommended by flooring manufacturer to complement flooring.
- .6 Primers and adhesives: Low VOC, waterproof, of types recommended by flooring and base manufacturer for specific material on applicable substrate, above, on or below grade.

- .7 Reducing edge strips, thresholds: Nitrile rubber plasticized vinyl, 80-95 Shore A Durometer, adhesive as recommended by manufacturer.
- .8 Concrete skim coat compound: High-performance, rapid-setting cement based skim coating compound. 'Ultra SkimCoat' by Mapei or approved alternative for filling minor voids and leveling existing substrate.
- .9 Stain sealer and polish: Type recommended by flooring manufacturer.

3 Execution

3.1 **EXAMINATION**

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.
- .2 Ensure concrete floors meet the following minimum requirements and requirements of the flooring manufacturer. If there is a conflict between these requirements and those of the flooring manufacturer, the more stringent shall apply.
 - .1 Internal Relative Humidity Test: Perform internal relative humidity testing in accordance with ASTM F2170. Results shall not exceed 80% RH.
 - .2 Moisture Test: Moisture emissions from concrete subfloors (cured for a minimum of 28 days) must not exceed 3 lbs per 1000sf per 24 hours (1.4 kg H₂O/24 hr/93 m²) for acrylic adhesive and 5lbs for polyurethane adhesive via the Calcium Chloride Test Method (ASTM F1869).
 - .3 The pH level of the subfloor surface shall not be higher than 9.9. If higher, subfloor must be neutralized.
- .3 Ensure that sub-floors have been provided as specified without holes, protrusions, cracks, depressions or other major defects.
- .4 Ensure that control joints have been filled and levelled.
- .5 Defective Work resulting from application to unsatisfactory surfaces will be considered the responsibility of those performing the Work of this Section.

3.2 **SUBFLOOR TREATMENT**

- .1 Install underlayment panels in accordance with manufacturer's written instructions.
- .2 Flooring shall be installed over subfloors conforming to ASTM F710 for concrete.
- .3 Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.
- .4 Apply sub-floor filler to low spots and cracks to achieve floor level to a tolerance of 1:1000, allow to cure.

- .5 Meet ASTM F710 Standard for Concrete or other monolithic floors.
- .6 Clean and remove all deleterious materials from surfaces to receive this Work in accordance with the adhesive manufacturer's recommendations.
- .7 Prime concrete to flooring manufacturer's printed instructions.

3.3 RESILIENT SHEET FLOORING APPLICATION

- .1 Install resilient sheet flooring in accordance with manufacturer's written instructions.
- .2 Apply adhesive uniformly using recommended trowel in accordance with flooring manufacturer's instructions. Do not spread more adhesive than can be covered by flooring before initial set takes place.
- .3 Run sheets in direction of traffic. Double cut sheet joints and continuously seal according to manufacturer's printed instructions. Remove adhesive seepage of seams or surface while adhesive is still wet.
- .4 Heat weld seams in accordance with ASTM F1516 and manufacturer's printed instructions.
- .5 As installation progresses and after installation, roll flooring with minimum 45kg roller to ensure full adhesion.
- .6 Cut flooring neatly around fixed objects.
- .7 Terminate flooring at centreline of door in openings where adjacent floor finish or colour is dissimilar.
- .8 Install reducing edge strips at unprotected or exposed edges where flooring terminates or where there are two finishes of different thicknesses.

3.4 PREFABRICATED FLASH COVE BASE APPLICATION

- .1 Install prefabricated flash cove base in accordance with manufacturer's written instructions.
- .2 Provide integral cove base at room perimeter and at built-in fitment locations complete with accessories as required for complete and secure installation.
- .3 Dry-fit prefabricated flash cove base; cut and fit material to required lengths. Mitre-cut inside and outside corners.
- .4 Dry-fit and cut cove cap prior to prefabricated flash cove base installation.
- .5 Scribe glue line on walls and floor at edge of prefabricated flash cove base material.

- .6 Apply adhesive in full spread (100% coverage on 2 surfaces) for full length of prefabricated flash cove base material. Apply prefabricated flash cove base to wall surface straight and level.
- .7 Slide cap behind prefabricated flash cove base material.
- .8 Hand roll prefabricated flash cove base material onto wall and floor surface removing bumps, ripples and fishmouths. Remove excess adhesive.
- .9 Heat weld seams (vertical and horizontal) in prefabricated flash cove base material.

3.5 CLEANING AND SEALING

- .1 Forty-eight hours after installation, clean sheet flooring surfaces with a mild soap solution approved by finish manufacturer. Rinse clean and allow to dry.
- .2 If recommended by flooring manufacturer, provide sealer for resilient flooring. Apply stain sealer and allow to dry. Unless otherwise recommended by flooring manufacturer, apply three to five coats of sealer as recommended by flooring manufacturer and polish thoroughly.

3.6 PROTECTION OF FINISHED WORK

- .1 Protect floors and bases from time of final set of adhesive until accepted by Consultant.
- .2 Protect prefabricated flash cove bases from scratches, gouges, scuff marks and other damage from time initial surface protection application until final inspection.
- .3 Prohibit traffic on floor for 48 hours after installation.
- .4 Cover cleaned surfaces with fibre reinforced, clean, non-staining clean, kraft paper. Secure in position with gummed tape to prevent drifting. Remove covering when directed by Consultant.

END OF SECTION

-
- 1 General
 - 1.1 **SECTION INCLUDES**
 - .1 Labour, Products, equipment and services necessary for resilient sheet flooring Work in accordance with the Contract Documents.
 - 1.2 **REFERENCES**
 - .1 ASTM F710, Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
 - .2 ASTM F1516, Standard Practice for Sealing Seams of Resilient Floor Products by the Heat Weld Method.
 - .3 ASTM F1869, Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
 - .4 ASTM F 2170, Standard Test Method for Determining Relative Humidity in Concrete Slabs Using in-situ Probes.
 - 1.3 **SUBMITTALS**
 - .1 Product data:
 - .1 Submit copies of manufacturer's Product data in accordance with Section 01 00 00 indicating:
 - .1 Performance criteria, compliance with appropriate reference standard, characteristics, and limitations.
 - .2 Product transportation, storage, handling and installation requirements.
 - .2 Shop drawings: Submit shop drawings indicating seam layout and welding procedures in accordance with Section 01 00 00.
 - .3 Samples:
 - .1 Submit samples in accordance with Section 01 33 00:
 - .1 Submit two 250 x 200 mm samples of each type of sheet material and colour.
 - .4 Closeout submittals: Submit maintenance and cleaning data for incorporating into Operations and Maintenance Manuals in accordance with Section 01 00 00.
 - 1.4 **SITE CONDITIONS**
 - .1 Maintain air temperature and structural base temperature at flooring installation area above 15°C for 48 hr before, during and 48 hr after installation.
 - .2 Store materials for 2 days prior to installation in area of Work to achieve temperature stability.

- .3 Do not lay flooring in conditions of high humidity or where exposed to cold drafts. In hot weather, protect from direct sunlight.
- .4 Provide adequate ventilation during installation.

1.5 MAINTENANCE

- .1 Submit extra 5% or to nearest full roll of each colour, pattern and type of flooring and base material required for maintenance use. Identify each roll. Store where directed. Submit maintenance material in one piece and of same production run as installed materials.

1.6 EXTENDED WARRANTY

- .1 Manufacturer's warranty
 - .1 Safety flooring: Provide flooring manufacturer's warranty naming Owner as beneficiary, for a period of ten (10) years from the date Work is certified as Substantially Performed.

2 Products

2.1 MATERIALS

- .1 All materials under Work of this Section, including but not limited to, primers and adhesives are to have low VOC content limits.
- .2 Slip resistant flooring (**RSSF-#**): Type, size, colour and finish indicted on finish schedule.
- .3 Welding rod: Type as recommended by flooring manufacturer.
- .4 Accessories: Types as recommended by flooring manufacturer.
- .5 Primers and adhesives: Low VOC, waterproof, of types recommended by flooring manufacturer for specific material on applicable substrate, above, on or below grade.
- .6 Concrete skim coat compound: High-performance, rapid-setting cement based skim coating compound. 'Ultra SkimCoat' by Mapei or approved alternative for filling minor voids and leveling existing substrate.
- .7 RESERVED.
- .8 Cove capping strips (**CC-#**):
 - .1 Provide self-coving PVC capping strip for cove bases. 'Cove Cap C7' by Altro Flooring, 'Cove Cap SCS' by Tarkett or approved alternative.
 - .2 Colours: Refer to drawings.

3 Execution

3.1 EXAMINATION

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.
- .2 Ensure concrete floors meet the following minimum requirements and requirements of the flooring manufacturer. If there is a conflict between these requirements and those of the flooring manufacturer, the more stringent shall apply.
 - .1 Internal Relative Humidity Test: Perform internal relative humidity testing in accordance with ASTM F2170. Results shall not exceed 80% RH.
 - .2 Moisture Test: Moisture emissions from concrete subfloors (cured for a minimum of 28 days) must not exceed 3 lbs per 1000sf per 24 hours (1.4 kg H₂O/24 hr/93 m²) for acrylic adhesive and 5lbs for polyurethane adhesive via the Calcium Chloride Test Method (ASTM F1869).
 - .3 The pH level of the subfloor surface shall not be higher than 9.9. If higher, subfloor must be neutralized.
- .3 Ensure that sub-floors have been provided as specified without holes, protrusions, cracks, depressions or other major defects.
- .4 Ensure that control joints have been filled and levelled.
- .5 Defective Work resulting from application to unsatisfactory surfaces will be considered the responsibility of those performing the Work of this Section.

3.2 SUBFLOOR TREATMENT

- .1 Flooring shall be installed over subfloors conforming to ASTM F710 for concrete.
- .2 Remove subfloor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with subfloor filler.
- .3 Apply sub-floor filler to low spots and cracks to achieve floor level to a tolerance of 1:1000, allow to cure.
- .4 Meet ASTM F710 Standard for Concrete or other monolithic floors.
- .5 Clean and remove deleterious materials from surfaces to receive Work in accordance with adhesive manufacturer's recommendations.
- .6 Prime concrete to flooring manufacturer's printed instructions.

3.3 RESILIENT SAFETY FLOORING APPLICATION

- .1 Install resilient sheet flooring in accordance with reviewed shop drawings and manufacturer's written instructions.
- .2 Apply adhesive uniformly using recommended trowel in accordance with flooring manufacturers instructions. Do not spread more adhesive that can be covered by flooring before initial set takes place.

- .3 Run sheets in direction of traffic. Double cut sheet joints and continuously seal according to manufacturer's printed instructions. Remove adhesive seepage of seams or surface while adhesive is still wet.
- .4 Heat weld seams in accordance with ASTM F1516 and manufacturer's printed instructions.
- .5 As installation progresses and after installation, roll flooring with minimum 45 kg roller to ensure full adhesion.
- .6 Cut flooring neatly around fixed objects.
- .7 Terminate flooring at centreline of door in openings where adjacent floor finish or colour is dissimilar.
- .8 Install reducing edge strips at unprotected or exposed edges where flooring terminates or where there are two finishes of different thicknesses.
- .9 Drains: Fit safety flooring and mechanically fasten to drain outlets to ensure a permanent, watertight installation in accordance with manufacturer's written instruction.
- .10 Coved Installation: Where safety flooring is coved up wall surfaces and other abutments, installation shall be in accordance with manufacturer's written instructions.
- .11 Where existing safety flooring work has been damaged and where indicated on drawings, repair and clean flooring to the acceptance of the Consultant.

3.4 **CLEANING**

- .1 Forty-eight hours after installation, clean vinyl surfaces with a mild soap solution approved by finish manufacturer. Rinse clean and let dry.

3.5 **PROTECTION OF FINISHED WORK**

- .1 Protect floors from time of final set of adhesive until accepted by Consultant.
- .2 Prohibit traffic on floor for 48 hours after installation.
- .3 Cover cleaned surfaces with fibre reinforced, clean, non-staining clean, kraft paper. Secure in position with gummed tape to prevent drifting. Remove covering when directed by Consultant.

END OF SECTION

1 General

1.1 SECTION INCLUDES

- .1 Labour, Products, equipment and services necessary for epoxy flooring work in accordance with the Contract Drawings.

1.2 SUBMITTALS

- .1 Product data: Submit manufacturer's Product data in accordance with Section 01 00 00 indicating:
- .1 Two copies of manufacturer's Product data on characteristics, performance criteria, and limitations.
 - .2 Preparation, installation requirements and techniques, Product storage, and handling criteria.
- .2 Samples: Submit duplicate samples of each type and colour of epoxy flooring mounted on 250 x 200 mm hardboard in accordance with Section 01 00 00.
- .3 Reports: Submit manufacturer's acceptance of substrate prior to installation in writing. Submit verification of moisture content of floor prior to installation.
- .4 Close-out submittals: Submit maintenance data for incorporation into Operations and Maintenance manuals in accordance with Section 01 00 00.

1.3 QUALITY ASSURANCE

- .1 Perform work of this Section by a company that has a minimum of five years proven experience in installations of a similar size and nature and that is approved by manufacturer. Submit to Consultant, applicator's current certificate of approval by the material manufacturer as proof of compliance.
- .2 Mock-up:
- .1 Construct one 2 m² mock-up of epoxy flooring in location acceptable to Consultant.
 - .2 Arrange for Consultant's review and acceptance, allow 48 hours after acceptance before proceeding with work.
 - .3 Mock-up may remain as part of Work if accepted by Consultant. Remove and dispose of mock-ups which do not form part of Work.
 - .4 Upon acceptance, mock-up shall serve as a minimum standard of quality for the balance of the work of this Section.
- .3 Pre-installation meetings: Arrange with manufacturer's representative and Consultant to inspect substrates, and to review installation procedures 48 hours in advance of installation.

1.4 SITE CONDITIONS

- .1 Do not install the work of this Section outside of the following environmental ranges without Product manufacturer's written acceptance:
 - .1 Ambient air and surface temperature: 15°C to 30°C.
 - .2 Relative Humidity: In accordance with manufacturers' requirements.
 - .3 When no dust is being raised.
 - .4 In well-ventilated and broom clean areas.
- .2 Do not apply epoxy flooring over materials that contain over 4% moisture.
- .3 Install temporary protection and facilities to maintain the Product manufacturer's, and the above specification, environmental requirements for 24 hours before, during, and 24 h after installation.
- .4 Post do not enter and appropriate warning signs at conspicuous locations.

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Package, seal and label each epoxy flooring material to show manufacturer's and product name, and colour.
- .2 Store materials at site in an area specifically set aside for purpose that is locked, ventilated, and maintained at a minimum temperature of 16°C.
- .3 Ensure that health and fire regulations are complied with in storage area, and during handling and application.

2 Products

2.1 MATERIALS

- .1 General:
 - .1 All materials under work of this Section, including but not limited to, primers and epoxy flooring are to have low VOC content limits.
 - .2 Each material used in the application of each flooring system shall be as recommended or manufactured by the supplier of the flooring system.
2. Epoxy flooring and base (**EPX-#**):
 - .1 6 mm thick, decorative, slip resistant, trowelled system, consisting of trowelled mortar base, epoxy undercoat, coloured broadcasted quartz aggregate, and clear, UV resistant, epoxy sealer.
 - .2 Colour and finish texture: As selected by the Consultant from manufacturer's full range.
 - .3 Epoxy flooring 'Stonshield HRI' by Stonhard, Inc. complete with sealer 'Stonkote CE4' or approved alternative by BASF Canada Inc. or Sika Canada Inc.

- .3 Waterproof membrane: Liquid applied, urethane waterproofing membrane, 'Stonproof ME7' by Stonhard, Inc. or approved alternative by BASF Canada Inc. or Sika Canada Inc.
- .4 Primer: As recommended by manufacturer.

3 Execution

3.1 **EXAMINATION**

- .1 Verify condition of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.
- .2 Verify that concrete floor has cured 28 days minimum and that substrate is acceptable to epoxy manufacturer.
- .3 Test surfaces for moisture content to ensure that they are suitable for application.

3.2 **PREPARATION**

- .1 Prepare substrate using steel aggregate blast method and vacuum substrate free of debris and dust.
- .2 Fill minor cracks and voids and prime surfaces in accordance with manufacturer's recommendations.
- .3 Protect adjacent surfaces from damage resulting from this work. Mask and/or cover adjacent surfaces, fixtures, and equipment as necessary.
- .4 Fill open control joints, and other cracks and voids with material compatible with epoxy materials.
- .5 Clean prime and seal surfaces as recommended by epoxy manufacturer.

3.3 **APPLICATION**

- .1 Apply waterproofing membrane to thickness and requirements as indicated in written instructions from epoxy manufacturer.
- .2 Apply epoxy flooring in accordance with manufacturer's printed instructions. epoxy manufacturer shall supervise application.
- .3 Stop epoxy in a straight line on each side of control joints; fill space over expansion joint with a self-levelling, non-sag polyurethane sealant.

- .4 Apply epoxy with care to ensure that no laps, voids, or other marks or irreg visible, and with an appearance of uniform colour, sheen and texture, all limitations of materials and areas concerned.
- .5 Match colours and textures of approved samples.
- .6 Make clean true junctions with no visible overlap between adjoining appli epoxy.
- .7 Chase edge of adjacent floor systems so that epoxy finishes flush with ad systems.
- .8 Provide 100 mm covered base at room perimeter and at built-in fitment loca cove with 25 mm radius.

3.4 **SITE TOLERANCES**

- .1 Finish surfaces shall be level, or straight where sloped to drains, within a 1.5 mm in 3 m, and shall not vary more than 0.8 mm in any running 300

3.5 **REPAIR**

- .1 Touch-up and refinish minor defective work. Refinish entire coated surfac where finish is damaged or otherwise unacceptable.

3.6 **CLEANING**

- .1 Remove promptly as work progresses spilled or spattered materials from work performed under other Sections. Clean floors on completion of work. surfaces while removing.
- .2 Leave storage and mixing areas in same condition as equivalent spaces

3.7 **PROTECTION**

- .1 Erect barriers to prevent the entry and presence of personnel not perfor this Section during application of epoxy flooring, and for 48 hours following of application.

END OF SECTION

- 1 General
- 1.1 **SECTION INCLUDES**
 - .1 Labour, Products, equipment and services necessary for hygienic wall cladding work in accordance with the Contract Documents.
- 1.2 **SUBMITTALS**
 - .1 Product data:
 - .1 Submit duplicate copies of manufacturer's Product data in accordance with Section 01 00 00 indicating:
 - .1 Performance criteria, characteristics, and limitations.
 - .2 Product transportation, storage, handling and installation requirements.
 - .2 Shop drawings:
 - .1 Submit shop drawings in accordance with Section 01 00 00 indicating:
 - .1 Elevations, sections, details, materials, dimensions, thicknesses, trim and accessory pieces, and interfacing with adjacent construction.
 - .3 Samples:
 - .1 Submit following samples in accordance with Section 01 00 00.
 - .1 Two 300 x 300 mm samples of wall cladding.
 - .2 Two 300 mm samples of each trim and accessory proposed for use.
 - .4 Certificates: Submit certification from material manufacturer that installation is in accordance with manufacturer's instructions.
 - .5 Closeout submittals: Submit maintenance and cleaning instructions for incorporation into Operations and Maintenance Manuals in accordance with Section 01 00 00.
 - 1.3 **QUALITY ASSURANCE**
 - .1 Installers qualifications: Perform work of this Section by a company that has a minimum of three years proven experience in the installation of wall cladding on projects of a similar size and nature and that is approved by manufacturer. Submit to Consultant, installer's current certificate of approval by the cladding manufacturer as proof of compliance.
 - .2 Mock-up:
 - .1 Construct one 2 m² mock-up of wall cladding system in location acceptable to Consultant.
 - .2 Arrange for Consultant's and manufacturer's review and acceptance prior to start of installation.
 - .3 Mock-up may remain as part of Work if accepted by Consultant. Remove and dispose of mock-ups which do not form part of Work.
 - .4 Upon acceptance, mock-up shall serve as a minimum standard of quality for the balance of the work of this Section.

1.4 **SITE CONDITIONS**

- .1 Do not install work of this Section outside of following environmental ranges without Consultant's and Product manufacturer's written acceptance:
 - .1 Ambient air and surface temperature: 15⁰C to 30⁰C.
 - .2 Relative Humidity: 45%.
- .2 Supply and install temporary protection and facilities to maintain Product manufacturer's, and above specified environmental requirements for 24 hours before, during, and 24 hours after installation.

2 Products

2.1 **MATERIALS**

- .1 All materials under work of this Section, including but not limited to, sealants and adhesives are to have low VOC content limits.
- .2 Wall cladding (WP1):
 - .1 Extruded rigid PVC sheets, coloured throughout, smooth finish, Agriculture and Agri-Food Canada Approved, 2440 mm x 1220 mm x 2.5 mm thick. 'Altro Whiterock' by Altro or approved alternative.
 - .2 Wall cladding to come complete with thermoformed corners and all accessories required to provide a complete system.
 - .3 Colour: Anywhere WP specified Contractor shall provide 2 colours from colour range.
- .3 Adhesive and sealant: Types as recommended by cladding manufacturer to suit intended application.

3 Execution

3.1 **EXAMINATION**

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.

3.2 **PREPARATION**

- .1 Verify substrate surfaces are solid, free of moisture, dust, oil, grease, scaling or laitance, projections and any other foreign matter detrimental to performance. Obtain manufacturer's approval of substrate in writing, submit copy to Consultant.

3.3 **INSTALLATION**

- .1 Install wall cladding in accordance with reviewed shop drawings and manufacturer's written instructions.
- .2 Dry-fit sheet prior to fixing.
- .3 Bevel leading edges of sheet prior to fitting joint and cap strips.
- .4 Apply adhesive to back of sheet uniformly using a 4.5 mm 'V' notched trowel. Allow adhesive to dry tacky to the touch.
- .5 Offer sheet to wall substrate. Roll sheet thoroughly with a wall roller to ensure full adhesion.
- .6 Cut sheet neatly to accommodate pipes, electrical boxes, etc., providing a 3 mm gap for expansion.
- .7 Fit sheets neatly at door and window trim providing a 3 mm gap for expansion.
- .8 Thermoform all inside and outside corners and specific shapes to fit building contours.
- .9 Install joint strips to each sheet as installation progresses.
- .10 Provide water tight seal to all pipes, projections, door and window trims with sealant.

3.4 **CLEANING**

- .1 Upon completion of installation, remove the protective film and wash with a dilute soap/detergent solution and rinse with clean water.

END OF SECTION

- 1 General
- 1.1 **SECTION INCLUDES**
 - .1 Labour, Products, equipment and services necessary for painting work in accordance with the Contract Documents.
- 1.2 **REFERENCES**
 - .1 Master Painters Institute (MPI), Painting Specification Manual.
 - .2 SSPC Steel Structures Painting Council, Standards.
- 1.3 **SUBMITTALS**
 - .1 Product data:
 - .1 Submit copies of manufacturer's Product data in accordance with Section 01 00 00 indicating:
 - .1 Performance criteria, compliance with appropriate reference standard, characteristics, limitations.
 - .2 Product transportation, storage, handling and installation requirements.
 - .2 Submit listing of manufacturer's Product types, Product codes, and Product names, number of coats, and dry film thicknesses, corresponding to each Painting Schedule code; submit listing minimum of 8 weeks before materials are required.
 - .2 Samples:
 - .1 Submit following samples in accordance with Section 01 00 00.
 - .1 Three 300 x 150 mm draw downs of each colour minimum 4 weeks before paints are required.
 - .2 Identify each sample with Contract number and title, colour reference, sheen, date, and name of applicator.
 - .3 Certificates:
 - .1 Submit certified documentation to confirm each airless spray painter has minimum of 5 years experience on applications of similar complexity and scope.
 - .2 Submit certified documentation to confirm each worker has Provincial Tradesman Qualification certificate of proficiency.
 - .4 Reports:
 - .1 Submit written field inspection and test report results after each inspection.
 - .2 Submit Field Quality Control test result reports for alkali content, substrate moisture, and dry film thickness.
 - .3 Submit electronic moisture meter manufacturer's specifications including tolerances. Submit record of latest meter calibration to meet manufacturer's recommendations.

1.4 QUALITY ASSURANCE

- .1 Finishing work: Perform work to MPI requirements for premium grade.
- .2 Supervision: Have work supervised by a full-time qualified foreperson who has 10 years minimum experience on Contracts of similar complexity and scope.
- .3 Mock-up:
 - .1 Construct three 3 m² mock-ups of different Paint Schedule code systems, selected by Consultant, in locations acceptable to Consultant to demonstrate installation workmanship, colour, and hiding power of Products.
 - .2 Obtain Consultant's acceptance in writing before proceeding with the work of this Section.
 - .3 Mock-ups may remain as part of the Work if acceptable to Consultant and will serve as a standard for similar code systems.
 - .4 Repaint over mock-ups which do not form part of the Work.

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Install correct, safe temporary storage for paint, thinner, solvents, and other volatile, corrosive, hazardous, and explosive materials in accordance with requirements of authorities having jurisdiction.
- .2 Post hazard warning signage in areas of storage and mixing. Install and maintain sufficient CO₂ fire extinguishers of minimum 9 kg capacity, accessible in each storage mixing and storage areas.
- .3 Maintain storage enclosures at minimum 10°C ambient temperature and to manufacturer's instructions.

1.6 SITE CONDITIONS

- .1 Apply coatings under the following conditions:
 - .1 When no condensation is possible (unless specifically formulated against condensation).
 - .2 Interior coatings: 7°C minimum.
 - .3 Relative humidity: 85% maximum.
 - .4 Not in direct exposure to sun light.
- .2 Maintain temperature conditions indicated above for 24 hours before, during and 24 hours after painting.
- .3 Install clean plywood sheets to protect floors and walls in storage and mixing areas, from paint drips, spatters, and spills.
- .4 Apply sufficient masking, clean drop cloths, and protective coverings for full protection of work not being painted including, but not limited to, the following:
 - .1 Light fixtures, fire and smoke detectors.
 - .2 Sprinkler heads.

- .3 Prepainted diffusers and registers.
- .4 Prepainted equipment.
- .5 Fire rating labels and equipment specification plates.
- .6 Finished surfaces.

1.7 ENVIRONMENTAL PERFORMANCE REQUIREMENTS

- 1. Provide paint products meeting MPI "Green Performance Standard GPS-1-05".

1.8 MAINTENANCE

- 1. Deliver to Owner's place of storage on completion of work, sealed containers of each finish painting material applied, and in each colour. Label each container as for original, including mixing formula. Provide the following:
 - .1 1 L of extra materials when less than 50 L are used for Project;
 - .2 3.78 L of extra stock when 50 to 200 L are used;
 - .3 7.57 L of extra stock when over 200 L are used.

2 Products

2.1 MATERIALS

- .1 Paint:
 - .1 All materials under work of this Section, including but not limited to, primers, stains, and paints are to have low VOC content limits.
 - .2 Products in accordance with the MPI Painting Specification Manual, Exterior and Interior Systems;
 - .1 Manufacture's premium grade, first line Products.
 - .2 Uniform dispersion of pigment in a homogeneous mixture.
 - .3 Ready-mixed and tinted whenever possible.
 - .3 Products within each MPI paint system code: From single manufacturer.
 - .4 Acceptable manufacturers:
 - .1 Benjamin Moore.
 - .2 Akzo Nobel.
 - .3 Dulux Paints/PPG.
 - .4 Para Painting & Coatings.
 - .5 Sherwin Williams.

2.2 COLOUR SCHEDULE

- .1 Consultant will select choice of colours and gloss when compiling a Colour Schedule after award of Contract; allow for colour selection beyond paint manufacturer's standard colour range.
- .2 Conform to gloss reflectance definitions listed in MPI Specification Manual.

2.3 **PAINTING AND FINISHING SCHEDULE**

- .1 Refer to Table 1, MPI Painting and Finishing Schedule coded systems, comply with MPI Painting Specification Manual.

Table 1: Painting and Finishing Schedule				
INTERIOR SUBSTRATES	Typical substrates (Including but not limited to)	MPI Manual Ref.	MPI Finish System Code	Topcoat
Metal Fabrications (Factory primed)		INT 5.1	INT 5.1R	High performance latex
Galvanized metal	HM doors & door frames	INT 5.3	INT 5.3B	WB light industrial coating
Gypsum board,	Drywall, walls, ceilings	INT 9.2	INT 9.2A	Latex
Gypsum board,	Wet areas	INT 9.2	INT 9.2F	Epoxy-modified latex

3 Execution

3.1 **EXAMINATION**

- .1 Verify condition of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.

3.2 **PREPARATION**

- .1 General:
 - .1 Clean substrate surfaces free from, dust, grease, soiling, or extraneous matter, which are detrimental to finish.
 - .2 Patch, repair, and smoothen minor substrate defects and deficiencies e.g. machine, tool and sand paper marks, shallow gouges, marks, and nibs.
 - .3 Clean, sweep, and vacuum floors and surfaces to be painted, debris and dust-free prior to painting.
 - .4 Refer to MPI Painting Specification Manual for surface preparation requirements of substrates not listed here.

- .2 Where finish hardware has been installed remove, store, re-install finish hardware, to accommodate painting. Do not clean hardware with solvent that will remove permanent lacquer finishes.
- .3 Alkali Content tests and neutralization:
 - .1 Test for ph level using litmus paper on dampened substrate.
 - .2 Neutralize surfaces over 8.5 ph with 4% solution of Zinc Sulphate for solvent based systems and tetrapotassium pyrophosphate for latex based systems, to below 8.0 ph, and allow to dry.
 - .3 Brush-off any residual Zinc Sulphate crystals.
 - .4 Coordinate paint system primer / sealer to be alkali-resistant.
- .4 Substrate moisture tests:
 - .1 Test for moisture content over entire surface to be painted, minimum one test/ 2 m² in field areas and one test/600 mm along inside corners including at ceiling to wall juncture.
 - .2 If any test registers above 10% allow entire substrate surfaces, within the plane, to dry further before paint system application. Install temporary drying fans if necessary.
 - .3 Re-test employing same criteria.
- .5 Metal Fabrications (existing): Scrape and either hand or power wire brush surfaces to remove mill and scale.
- .6 Galvanized steel sheet:
 - .1 Z275 (Satin & Spangled Sheet): SSPC SP7 brush blast.
 - .2 ZF075 (Wiped Coat): Remove contamination, wash with Xylene solvent.
 - .3 Touch-up damaged galvanized areas with organic zinc rich primer.
- .7 Galvanized iron and steel: Prepare galvanized and ungalvanized metal surfaces as follows:
 - .1 Unpassivated, unweathered and weathered: Remove contamination, wash with Xylene or Toluol solvent, allow to dry thoroughly. Make paint system primer/sealer an etching type primer.
 - .2 Manufacturer pre-treated (including passivated): SSPC SP7.
 - .3 Touch-up damaged galvanized areas with organic zinc rich primer.
- .8 Structural steel and miscellaneous metal fabrications:
 - .1 Coordinate the following with the responsible trades:
 - .1 Rust, mars, mill scale, and weld-burn touch-ups.
 - .2 Oil, grease, weld flux and other residue removal.
 - .2 Prime paint items, not otherwise indicated to be primed as part of another Section.
 - .3 Touch-up damaged galvanized areas with organic zinc rich primer.
- .9 Factory primed surfaces:
 - .1 Touch up damaged areas.
 - .2 Clean as required for top coat.

- .10 Gypsum board (existing):
 - .1 Remove dust, dirt, oil, grease, glue and all foreign material. Clean with stiff fibre brush prior to applying primer coat.
 - .2 Coordinate repairs and touch-ups with the responsible trade.
 - .3 Lightly sand surface to smooth out ridges and provide neat smooth surface.
- .11 Gypsum board:
 - .1 Apply primer/sealer paint to reveal defects and deficiencies and to equalize absorption areas.
 - .2 Coordinate repairs and touch-ups with the responsible trade.
 - .3 Re-prime repairs.
- .12 Coordinate with other trades to prevent:
 - .1 Damage, and inadvertent activation of fire and smoke detectors.
 - .2 Odour and dust distribution by permanent HVAC systems including fouling of ducts and filters.
- .13 Field-mix Products in accordance with manufacturer's written instructions.

3.3 APPLICATION

- .1 Apply painting systems in accordance with the MPI Painting Specification Manual. Apply each Product to manufacturer's recommended dry film thickness.
- .2 Painting systems listed are required minima, apply additional coats if necessary to obtain substrate hiding acceptable to the Consultant.
- .3 Tint intermediate coats lighter than final top coats for identification of each succeeding coat and to facilitate inspections. Include only manufacturer's recommended reducing and tinting accessories. Do not add adulterants.
- .4 Primer to be specialized primer coating system as required by manufacturer for selected colour. Standard primer being tinted shall be tinted to a maximum of 1.5% by volume.
- .5 Sand lightly between coats to achieve a tooth or anchor for subsequent coats.
- .6 Apply paint uniformly in thickness, colour, texture, and gloss, as determined by the Consultant under adequate illumination and viewed at a distance of 1500 mm. Apply finishes free of defects in materials and application which, in the opinion of the Consultant, affect appearance and performance. Defects include, but are not limited to:
 - .1 Improper cleaning and preparation of surfaces.
 - .2 Entrapped dust, dirt, rust.
 - .3 Alligatoring, blisters, peeling.
 - .4 Scratches, blemishes.
 - .5 Uneven coverage, misses, drips, runs, and poor cutting in.

- .7 Do not apply coatings on substrates which are not sufficiently dry. Unless indicated otherwise, allow each painting system coat to cure dry and hard before following coats are applied.
- .8 Repaint entire areas of damaged or incompletely covered surfaces, to the nearest inside or outside corner; patching will not be permitted.
- .9 Miscellaneous painting requirements:
 - .1 Paint projecting ledges, and tops, bottoms and sides of doors both above and below sight lines to match adjacent surfaces.
 - .2 Paint door frames, access doors and frames, door grilles, prime coated butts, and prime coated door closers to match surface in which they occur.
 - .3 Finish closets and alcoves as specified for adjoining rooms.
 - .4 Paint light coves white whether a light lense is installed or not, unless otherwise indicated.
 - .5 Paint interior columns to match walls of room.
 - .6 Allow for:
 - .1 2 wall colours per room, one ceiling colour per room.
 - .2 Different door colours in each functionally different area.
 - .3 Different colours on both sides of same door.
- .10 Mechanical, electrical and other painting coordination:
 - .1 Paint mechanical services in accordance with Mechanical Identification Division 21, 22 and 23.
 - .2 Coordinate painting of pipes, ducts, and coverings with the work of Division 21, 22 and 23 to precede pipe colour banding, flow arrows, and other pipe identification labeling installation.
 - .3 Paint exposed conduit, pipes, hangers, ductwork, grilles, gratings, louvres, access panels, fire hose cabinets, registers, convector and radiator covers, enclosures, and other mechanical and electrical equipment including services concealed inside cupboard and cabinet work; apply colour and sheen to match adjacent surfaces, except as noted otherwise.
 - .4 Paint portions of surfaces such as duct interiors, piping, ductwork, hangers, insulation, walls, and similar items, visible through grilles, louvres, convector covers etc., matte black in colour.
 - .5 Remove the following to accommodate painting, carefully store, clean, then re-install on completion of each area and when dry:
 - .1 Switch and receptacle plates, fittings and fastenings, grilles, gratings, louvres, access panels, convector covers, and enclosures .

3.4 FIELD QUALITY CONTROL

- .1 Dry film thickness tests:
 - .1 Test for film thickness over entire surface to be painted, minimum one test/2 m² in field areas and one test/600 mm along inside corners including at ceiling to wall juncture.
 - .2 If any test registers below specified thickness, re-apply paint to entire surface to nearest inside and outside corners.

- .3 If test registers more than 50% above specified thickness, consult with paint manufacturer, determine if problem exists, offer solutions to Consultant, and repair as directed.
- .4 Re-test employing same criteria after repair.

3.5 CLEANING

- .1 Remove spilled, splashed, and spattered paint promptly as work proceeds and on completion of work. Clean surfaces soiled by paint spillage and paint spatters. Repair or replace damaged work, as directed by Consultant.

3.6 PROTECTION

- .1 Post Wet Paint signs during drying and restrict or prevent traffic where necessary.
- .2 Post sign, after Consultant's inspection and acceptance of each room, reading: PAINTING COMPLETE - NO ADMITTANCE WITHOUT CONTRACTOR'S PERMISSION.

END OF SECTION

-
- 1 General
- 1.1 **SECTION INCLUDES**
- .1 Labour, Products, equipment and services necessary for miscellaneous specialties work in accordance with the Contract Documents.
- 1.2 **SUBMITTALS**
- .1 Product data:
- .1 Submit duplicate copies of manufacturer's Product data for each Product specified in accordance with Section 01 00 00 indicating:
- .1 Performance criteria, compliance with appropriate reference standard(s), characteristics, and limitations.
- .2 Product transportation, storage, handling and installation requirements.
- .2 Shop drawings:
- .1 Submit shop drawings in accordance with Section 01 00 00 indicating elevations, sections, details, dimensions, materials, gauges, and finishes.
- .3 Closeout submittals: Submit cleaning and maintenance instructions for miscellaneous specialties for incorporation into Operations and Maintenance Manuals in accordance with Section 01 00 00.
- 1.3 **DELIVERY, STORAGE, AND HANDLING**
- .1 Package or crate, and brace products to prevent distortion in shipment and handling. Label packages and crates, and protect finish surfaces by sturdy wrappings.
- 2 Products
- 2.1 **MANUFACTURED UNITS**
- .1 Corner guard (**CG1**): 76 mm x 76 mm x 90°, 2 mm thick Acrovyn cover finish, corner guard, 6.5 mm radius cover. Surface mounted 'SM-20N' by Acrovyn or approved alternative. Colour to be selected by Consultant from manufacturer's full colour range.
- .2 Crash Rail: ASTM B221, 6060-T6 aluminum alloy with clear anodized finish, size approximately 150 mm high x 82 mm offset, mounted directly to wall; fire resistance, flame spread maximum 20, smoke developed maximum 350-450; unit shall be complete with 50 mm radius ends; colour to later selection by Architect from manufacturer's standard range.
- .1 Model ECR-60A by Construction Specialties Ltd.
- .2 Or approved alternative by InPro Corporation or McGill Architectural Products.

- .3 Access door (walls and ceilings): Non-fire rated, prime coat steel flush mounted access door constructed of 1.5 mm thick (16 ga.) door with rounded corners and one piece 1.2 mm thick (18 ga.) frame. Door to have continuous concealed hinge and stainless steel screwdriver operated latch. 'UF-5000' by Acudor Access Doors or approved alternative.

3 Execution

3.1 **EXAMINATION**

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.

3.2 **PREPARATION**

- .1 Verify substrate surfaces are solid, free from surface water, dust, oil, grease, projections and other foreign matter detrimental to performance.
- .2 Items to be built-in: Provide information and templates required for installation of work of this Section, and assist or supervise, or both, the setting of anchorage devices, and construction of other work incorporated with products specified in this Section in order that they function as intended.
- .3 Verify there is adequate supports and/or blocking in gypsum wall assemblies prior to installation of miscellaneous specialty items as required.

3.3 **INSTALLATION**

- .1 Install miscellaneous specialties level and securely and rigidly anchored to substrate in accordance with authorities having jurisdiction, reviewed shop drawings, and manufacturer's written instructions.
- .2 After installation, adjust miscellaneous specialties in accordance with manufacturer's written instructions.

3.4 **CLEANING**

- .1 Clean and polish exposed surfaces prior to acceptance by Consultant.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Division 1 General Requirements of the Contract, are a part of this Section and shall apply here.
- .2 The General Contractor shall be responsible for all work contained in this section of the specification including the work provided by the:
 - Foodservice Division 11400;
 - Electrical Division 16000;
 - Mechanical Division 15000; and
 - Other trades subcontractors.

.3 ABBREVIATIONS

S.S.	-	Stainless Steel
C/W	-	Complete With
A.F.F.	-	Above Finished Floor
A	-	Amperes
V	-	Volts
CY	-	Cycle
P	-	Phase
Pl. lam.	-	Plastic Laminate
Kw	-	Kilowatt
kPa	-	Kilopascals
J.B.	-	Junction Box
L/S	-	Litres per Second
L.E.D	-	Light Emitting Diode
mm	-	Millimetres
C	-	Celsius
C.P.	-	Chrome Plated
I.P.S.	-	Inside Pipe Size
N.I.C.	-	Not in Contract (for Section 11400 Food Service Equipment)
L.C.	-	Load Centre
CBP	-	Circuit Breaker Panel
FES	-	Foodservice Equipment Sub-contractor

1.2 RELATED WORK BY OTHER TRADES

1.2.1 WORK PROVIDED BY ELECTRICAL DIVISION 16

- .1 Supply, rough-in, installation and connection of all necessary electrical wiring in liquid tight flexible conduit (AC-90) required for the operation of, but not limited to the foodservice equipment and ware-washing units unless otherwise stated in Part 1.3 of this Section of the Specification.
- .2 Supply and installation of electrical wiring from the building source or distribution point of power, through disconnect switches or starters to the terminals, connection box, circuit breaker panel or plug receptacles located on the equipment. Equipment manufacturer's control panels and switches are not considered to be a disconnect switches unless specifically permitted by applicable codes.
- .3 Inter-wiring of the fire suppression system specified under Division 15 to the maintenance annunciator panel or building security system as required including building fire and trouble annunciation.
- .4 Supply, rough-in and installation of all electrical wiring for "Owners Supplied", "Existing" or "NIC" designated equipment, as well as the final hook-up or connections.
- .5 Supply, rough-in and capping off of electrical wiring required for any equipment designated as "Future".
- .6 Supply and installation of all waterproof electrical receptacles located in floors, ceilings or walls.

1.2.2 WORK PROVIDED BY MECHANICAL PLUMBING - DIVISION 15

- .1 Supply, installation, rough-in, and connection of all domestic hot and cold water, drains, vents and gas supply lines as per code from building supply to the point of connection required for the complete operation of, the foodservice equipment.
- .2 Supply and installation of domestic hot and cold water lines complete with shut off valves, back flow preventers, line strainers, shock absorbers, pressure, temperature and pressure gauges and control valves or devices (unless otherwise stated and/or supplied with the equipment of this section).
- .3 Supply and installation of drain lines complete with traps, vent piping and clean outs.

- .4 Supply and installation of drain lines, traps, vent piping, clean outs and grease traps, sediment interceptors, drains for floor pans, connected drains for equipment, floor drains with funnels for open drains on equipment.
- .5 Supply and installation of all indirect drain lines including, but not limited to those required for foodservice equipment, ware-washing equipment and any other open or indirect type connections from custom fabricated stainless steel equipment to a hub, funnel or combination drain at a rate of not less than 25mm in 610mm.
- .6 Disconnection of any existing equipment to be reused from existing kitchen facilities.
- .7 Supply, rough-in and installation of all electrical wiring for "Owners Supplied", "Existing" or "NIC" designated equipment, as well as the final hook-up or connections.
- .8 Connection of all equipment designated as "Owner Supplied".
- .9 Roughing-in and capping off of mechanical services required for any equipment designated as "Future".
- .10 Use chrome plated piping wherever exposed.

1.2.3 WORK PROVIDED BY THE MECHANICAL HVAC - DIVISION 15 FOR KITCHEN EXHAUST SYSTEMS – NOT APPLICABLE FOR THIS PROJECT

1.2.4 WORK PROVIDED BY OTHER TRADES

- .1 Construction of all walls, partitions or ceilings, openings therein and finishes thereon.
- .2 Supply and installation of floors, floor leveling materials and floor finishes throughout the foodservice areas as required.

1.3 WORK INCLUDED BY FOODSERVICE DIVISION 11400 SUB-CONTRACTORS

1.3.1 GENERAL

- .1 The work listed here applies to the following foodservice sub sections:
 - Foodservice Equipment
- .2 The work listed here includes, but is not limited to, the provision of all equipment indicated on the drawings and listed in the specifications together with labour, material, tools, plant, delivery, uncrating, setting-in-place of equipment, ready for final connection of services by mechanical and electrical trades.
- .3 Coordination with the construction schedule of the delivery and set-into-place of all large foodservice equipment that may not fit through normal building doorways.

1.3.2 ELECTRICAL

- .1 All work shall comply with the standards for material and workmanship specified under Division 16.
- .2 Supply and installation of all motors integral with equipment complete with starters and internal thermal overload protection.
- .3 Supply and installation of all internal wiring on custom fabricated items in a concealed and well supported manner and terminated inside circuit breaker panels or junction boxes ready for final connection by the electrical trades. All equipment shall be inspected by the local hydro authority and carry CSA and ULC approval.
- .4 Supply and installation of all necessary junction boxes and circuit breaker panels (electrical load centres) where required.
- .5 Tag each multiple electrical wire or cable used in any custom fabricated piece of equipment to indicate the item serviced. When circuit breaker panels are used, identify each circuit.
- .6 Supply and installation of cords and plugs on equipment as required and match the plug with the respective receptacle.
- .7 Supply and installation of watertight electrical outlets on all custom fabricated equipment. Mount electrical plug receptacles with stainless steel cover plates and casings. Furnish and install waterproof wiring.

1.3.3 MECHANICAL

- .1 All work shall comply with the standards for material and workmanship specified under Division 15.
- .2 Provision and installation of all faucets complete with aerators and replaceable seats, ready for connection by appropriate contractor.
- .3 Supply and installation of chrome plated overflow assemblies, drain fittings and traps with tail pieces for all sink type assemblies.
- .4 Supply and installation of chrome plated blowdown piping from items with relief or safety valves, extend piping to nearest hub or floor drain approximately 4" (100mm) above drain.
- .5 Supply of pressure regulating valves on domestic hot and cold water, low temperature chilled water, gas, steam or condensate lines for equipment supplied herein.
- .6 Conceal and support of all piping and accessories within custom fabricated equipment.
- .7 Interconnection of drains and water lines between common multiple pieces of equipment.

1.3.4 PREFABRICATED, INSULATED WALK IN TYPE REFRIGERATED AND FROZEN ROOM ASSEMBLIES – NOT APPLICABLE FOR THIS CONTRACT

1.3.5 MECHANICAL REFRIGERATION SYSTEMS – NOT APPLICABLE FOR THIS CONTRACT

1.3.6 EXHAUST VENTILATOR(S) (HOODS) AND FIRE SUPPRESSION SYSTEMS – NOT APPLICABLE FOR THIS CONTRACT

1.3.7 MISCELLANEOUS

- .1 Supply and installation of all hardware and standard accessories normally part of the equipment whether shown and/or specified or not; ie locks, catches, handles, hinges, etc.
- .2 Provision of rubber button feet or pads under any piece of equipment that will rest on a counter.

- .3 Provision of plastic laminated, painted or other applied finishes as specified or shown. Colour shall be so designated by the Architect/Consultant and/or Owner.
- .4 Caulking and sealing of equipment to walls, curbs, bases, adjacent units and between any dissimilar materials. Use an approved silicone sealer for gaps under 8mm and stainless steel trim strips and sealer for wider gaps. Prepare area being siliconed prior to silicone application.
- .5 Securing of all permanent equipment to floor or base. Use stainless steel shims for leveling.
- .6 Supply and installation of all stainless steel strips and filler pieces necessary to properly finish any individual or combined set of pieces of equipment as part of the contract.
- .7 Protection, identification and recessing of all controls, pilot lights, switches and valves on any item of equipment.
- .8 Provision of all necessary access panels within each piece of equipment to allow for proper maintenance and service. Allow access when two (2) or more units are adjacent to each other.
- .9 Supply of all standard equipment accessories normally furnished with all items specified whether indicated or not.
- .10 Provision of all inserts, bolts, anchors, sleeves, ferrules, sleepers and other assorted hardware as may be necessary for the proper anchorage, fixing or attachment of equipment to the building.
- .11 Verification of the dimensions and services of all pieces of equipment that may be supplied by the Owner but are to become a part of a unit specified under this work in order to ensure a proper fit and co-ordination of installation.

1.4 QUALITY ASSURANCE

- .1 The work of this section shall be executed by qualified Foodservice Equipment Sub-contractors such as foodservice equipment dealer.
- .2 Each Foodservice Sub-contractor shall have capable plant, engineering, supervisory personnel and a minimum of five (5) years of experience in Canadian foodservice equipment supply and installation.
- .3 If the Foodservice Sub-contractor performing the work included in this specification is an equipment dealer only, the firm shall at the time of tendering, provide in writing the name, address and qualifications of the

fabricator proposed for the manufacturing and installation of custom stainless steel equipment .

- .4 Before submitting tenders, it is the responsibility of the bidder to carefully examine the drawings, specifications and the site to become aware of all existing conditions and limitations and to ensure that all of the work called for will be included in the tender submission.
- .5 All equipment and components supplied from manufacturers shall be the latest model or issue and shall be new and unused in every respect.

1.5 TENDER FORMAT

- .1 Comply with Division 1, General Requirements and all documents referred to therein.
- .2 Conform to the tender form provided at the end of this specification.
- .3 Submit an itemized price breakdown of the cost for each piece of equipment specified, including labour and materials with the tender form provided in Section 4 of the specification. Separately indicate the applicable Taxes if applicable and a separate cost for transportation, delivery, un-crating and setting into place.
- .4 Prices tendered shall be for the manufacturer as specified in the first instance for each piece of equipment listed in the item specification section and shall form a base stipulated price bid.
- .5 Prices tendered for the other acceptable manufactures as indicated in the item specification shall be included on a separate form provided in Section 4 of this specification and shown as either an addition to, or deletion from, the base stipulated price bid.
- .6 List the item number, name and quantity of each item together with the manufactures name and model number.
- .7 Failure to provide the itemized list of equipment with identification of the manufacturer, model number and individual price forming the base stipulated price bid may disqualify the tender submission.

1.6 ALTERNATIVES AND SUBSTITUTIONS

- .1 Refer to Division 1 - General Requirements.
- .2 The specifications, drawings and mechanical and electrical services etc., have been prepared on the basis of the brand names and models identified in the first instance for each individual piece of equipment as listed in the item specification. The tender must include a base stipulated price bid for the foodservice equipment as specified in the first instance for each individual piece of equipment. Tenders which include any other brand or model other than what was specified in the first instance for any individual piece of equipment in the base stipulated price bid may be rejected.
- .3 Should the bidder elect to use one of the acceptable alternative manufactures listed in the item specification, he/she may do so by submitting an alternative price for this item together with the chosen manufacturer and model number etc. Acceptable alternative manufacturers proposed for any equipment item must be listed on a separate page for "Acceptable Alternative Manufactures" located at the end of the tender form provided in Section 4 of this specification. Acceptable alternatives proposed, must indicate the addition to, or deletion from, the cost of the base stipulated price bid. The alternative price must also show and include the cost of all changes or modifications in the building necessary to accommodate the installation of the alternative item.
- .4 Alternatives proposed other than those listed in the specification as being acceptable alternative manufacturers may be submitted for review and consideration by the Owner and/or Consultant. These must be submitted in advance of the tender close and must be pre-approved in writing by the Owner and/or Consultant in order to be considered.
- .5 If an alternative other than those listed in the specification as being acceptable alternative manufacturers is proposed, the item must be submitted on a separate page included at the end of the tender form for "Other Pre-Approved Acceptable Manufactures" together with the chosen manufacturer and model number etc. Other pre-approved acceptable alternatives must indicate the addition to, or deletion from, the cost of the base stipulated price bid.
- .6 Alternatives proposed other than acceptable alternative manufacturers, must meet the physical and technical requirements of the specified item, be of a known and recognized manufacturer and satisfy the performance criteria and design intent originally determined by the Consultant in conjunction with the Owner.

- .7 Any alternative that is judged not to meet the above requirements, criteria or intent for whatever reasons shall be rejected and the model and manufacturer originally specified shall be supplied and installed at no additional cost to the Contract.
- .8 The proposed alternative and costs will be evaluated against the requirements set for the original specified manufacturer or model and a final decision made prior to the signing of a contract.
- .9 If any alternative is accepted, it is the responsibility of the respective Foodservice Equipment Sub-contractor to coordinate and bear all costs for mechanical, electrical, structural, architectural and any other adjustments necessary as a result of the substitution.
- .10 The Foodservice Equipment Sub-contractor awarded the work under Section 11400, shall also pay the costs of all professional fees and disbursements required to make necessary adjustments to the plans, specifications, mechanical and electrical requirement schedules or other information as a result of the substitution and for any coordination that must be done by the other project Consultants to accommodate any alternatives that are accepted.

1.7 REJECTION OF TENDERS

- .1 Refer to Division 1 General Requirements.

1.8 ADDENDA

- .1 Refer to Division 1 General Requirements.

1.9 CERTIFICATES OF APPROVAL

- .1 Conform to all laws, bylaws, rules, regulations and requirements of all authorities having jurisdiction.
- .2 All electrical equipment must conform to the Canadian Hydro Electrical Code, the Electrical Inspection Department Bulletins, the Ontario Hydro Electric Safety Code and the Canadian Standards Association. All equipment must have a C.S.A. approval label. Equipment that is not C.S.A. approved will be rejected, removed from the site and substituted for at no additional cost to the Contract.
- .3 Any plumbing or drainage systems shall conform to the Plumbing Code and Ontario Water Resources Act except as modified by regulations and bylaws of authorities having jurisdiction.

- .4 Each piece of equipment shall be accompanied by a label or certificate of approval.
- .5 All mechanical refrigeration system shall be supplied with safety relief valves, shut-off valves for each piece of equipment and all other items as required by local regulations.
- .6 All welded pressure vessels shall be constructed to ASME Code. The vessels shall bear the stamp and certificates framed under glass and hung adjacent to the vessel.
- .7 Equipment design and fabrication must conform with the National Sanitation Foundation and Provincial as well as Local Municipal Health Department Regulations.

1.10 PERMITS

- .1 The Foodservice Equipment Sub-contractor shall be responsible to obtain and pay for all relevant permits or special inspections. No extra allowances will be considered for costs incurred.

1.11 SHOP DRAWINGS AND MECHANICAL AND ELECTRICAL REQUIREMENTS

- .1 Provide shop drawings, product data and samples as requested by this Section, in accordance with Section 01300.
- .2 All fabricated items and assemblies of equipment shall be completely illustrated by shop drawings with detailed descriptions, clearly indicated methods of construction, gauges, assembly, fastenings and services, etc.
- .3 Drawings prepared by the Consultant depict equipment design intent only. It is the responsibility of the foodservice equipment sub-contractor to prepare shop drawings in conjunction with the Consultants' drawings, specifications, mechanical and electrical data, details and other information. The Foodservice Equipment Sub-contractor shall be responsible to coordinate all shop drawings with Architectural and Engineering plans, as built site conditions and the work of all relevant Sections.
- .4 Identify and explain any variation in the shop drawings which do not adhere to the original specifications or details. Advise the Consultant in writing of any conditions that would limit or adversely affect the design intent.

- .5 Ensure that all component parts and assemblies of each piece of equipment will support the loads anticipated without detriment to function, safety or appearance.
- .6 Prepare shop drawings on the same size sheet as plans and elevations, in a scale of not less than 1:50 metric for plans and 1:25 for details and sections so as to clearly illustrate the construction and arrangement of equipment.
- .7 Prepare fully dimensioned "roughing-in" and final connection point drawings for mechanical and electrical services. Separate mechanical and electrical, or combined drawings, may be submitted. In either case, drawings must be a minimum of 1:50. Include walk-in and fire suppression schematics and any pertinent installation diagrams including dimensioned "sleeving" drawing.
- .8 "Rough-in" and "final connection point drawings" must include a list of symbols for each type of connection and must show the location of connections on equipment as well as the location of the rough-in point for all mechanical and electrical services. Both connections to the equipment and the rough-in point must be dimensioned so as to show the relative distances from grid lines or architectural wall reference points as well as the height above the finished floor.
- .9 Verify the energy requirements for any piece of equipment that is being supplied by the Owner or is existing and being reused. Incorporate this information into the shop drawings, "rough-in" and connection point drawings.
- .10 Base, curb and depression drawings including low walls, cut-outs and openings must be fully dimensioned and drawn at 1:50 scale.
- .11 Submit equipment data sheets and shop drawings in the following order:
 1. Catalogue cuts and illustrations.
 2. Plan lay out drawing with mechanical and electrical "roughing-ins" and "connection points"
 3. Custom fabricated items
- .12 Review of shop drawings is general and applies to design only, it is not intended to serve as a final check and shall not relieve the Foodservice Equipment Sub-contractor of the responsibility for errors in dimensions, quantity, material or interfacing as required to complete the intent of the design.

- .13 All shop drawing submissions shall be checked and signed by a senior member of the firm qualified to evaluate the function and construction necessary.
- .14 The Consultant reserves the rights to reject any submissions that do not comply with the standards noted herein.
- .15 After the drawings have been reviewed, provide the number of sets required by the Consultant for distribution. Do not proceed with the fabrication until the drawings have been reviewed by the Consultant.
- .16 The Foodservice Equipment Sub-contractor shall be responsible to keep one (1) copy of the reviewed shop drawings on the project job site in good order available to all consultants approved
- .17 Examine the drawings and specification of all Sections for any information that may affect this work and co-ordinate the architectural and service requirements with other appropriate contractors.
- .18 Submit one (1) digital copy each shop drawing submitted.
- .19 All shop drawings must be prepared using AutoCAD. Hand drawn shop drawings will be automatically rejected without review and returned to the Foodservice Equipment Sub-contractor.
- .20 "Rough-in" and connection point drawings will not be reviewed unless the catalogue cuts and illustrations are submitted first.

1.12 CATALOGUE CUTS AND ILLUSTRATIONS

- .1 All manufactured items being purchased by the Foodservice Sub-contractor must be illustrated by catalogue cuts and data sheets.
- .2 Submit sets of illustration/cuts bound in booklet form for review. Sheets are to be in numerical order, properly labeled with the name of the project and accompanied by a lead sheet with an itemized list of contents. The lead sheet must include the project name, the name of the General Contractor (if applicable), the name of the Foodservice Equipment Sub-contractor, the item number, the manufacturers name and model number, all options and accessories included as well as mechanical and electrical service requirements.
- .3 Ensure that the equipment suits the space allocations and the intent of the design.
- .4 After the illustrations have been reviewed, provide the required number of sets for distribution.

1.13 AS-BUILT DRAWINGS

- .1. Provide As-Built drawings as requested by this Section, in accordance with Section 01780.
- .2. In addition to preparing shop drawings illustrating custom fabricated equipment or assemblies, the Foodservice Equipment Sub-contractor shall be responsible to prepare a set of as-built drawings of the foodservice equipment. These as-built drawings are to include:
 - 1:50 final plan drawings of on AutoCad version 14 or 2000; and

1.14 MAINTENANCE MANUALS

- .1. Provide maintenance manuals as requested by this Section, in accordance with Division 1 General Requirements.
- .2. Maintenance manuals are to include the following:
 - Emergency contact names;
 - Finalized itemized list of food equipment by component and functional area indicating item number, quantity, manufacturer, model number, etc. for all new and relocated existing equipment;
 - Detailed schedule of the mechanical, electrical and structural requirements for new and re-used existing equipment with connection size information; and
 - One (1) copy of all shop drawings.

PART 2 - PRODUCTS

2. PRODUCTS

2.1 GENERAL

- .1 All equipment supplied under this contract shall be made of the best grade materials and with first class workmanship and shall be in strict accord with the Drawings and Specifications.
- .2 The specifications attached hereto shall be considered the minimum acceptable standard and all equipment supplied shall be within the intent of approved shop drawing and specification.
- .3 Unless otherwise specified in the Itemized List of Equipment, fabricated equipment referred to as "stainless steel" shall incorporate the materials listed in 2.2 wherever necessary.
- .4 Trademarks and labels, including applied trademarks and labels are not acceptable in the finished work, except those required for operating instructions.

2.2 MATERIALS

- .1 Materials for fixed surfaces shall be impervious to moisture, corrosion resistant, smooth and able to withstand regular cleaning and sanitizing.
- .2 Stainless steel, denoted by the abbreviation "s.s." in this specification shall be ASTM-A167-81A, (18-8 Analysis) type 304 cold rolled and annealed, No. 4 finish one side, 180 grit finish free of buckles, pits, warps and imperfections. Ensure that direction of grain matches throughout units.
- .3 Stainless steel tubing shall be 304, seamless and welded, No. 4 finish, 38mm sq. for all legs and bracing.
- .4 Nuts, bolts, screws, washers and other fastenings shall be type 304 stainless steel.
- .5 Galvanized steel sheet, generally referred to as Satincoat; zinc coated, 380 gms/sq. m. Where such material is used as an exposed surface, it shall be finished with one (1) coat of primer and two (2) coats of air dry enamel, silver gray unless otherwise specified.
- .6 Structural steel shall be new material, conforming to recognized standards, grade 300W, cleaned and primed.
- .7 Gauges of material refer to U.S. Standard Gauges.

- .8 Plywood to be Douglas Fir, minimum 5 ply construction conforming to CSA 0121, good two (2) sides, waterproof where required.
- .9 Particle board to be CAN 3 0188.1 MÄ78 with smooth dense surfaces.
- .10 Laminated plastic sheet and decorative materials used to clad surfaces of wood or metal shall be Arborite, Formica or Nevamar, 1.0mm thick or such other materials as may be specified or indicated on the Drawings. Where plywood or wood particle board panels are being clad, apply laminate manufacturer's backing sheet wherever necessary to obtain a balanced construction and prevent warpage. All panels shall be 19mm thick before plastic laminate is applied. Finish all exposed edges.
- .11 Sound deadening, 3mm thick rigid waterproof insulation, Component Hardware M75-1366 applied under working surfaces.
- .12 Gauges are as follows:
 - 1.0 mm - 20 ga.
 - 1.2 mm - 18 ga.
 - 1.6 mm - 16 ga.
 - 2.0 mm - 14 ga.
 - 3.0 mm - 12 ga.

2.3 ELECTRICAL COMPONENTS

- .1 Electrical parts supplied under this Section shall be compatible with materials specified for use on this project. Refer to Division 16. Receptacles shall have stainless steel cover plates and screws. Cords and caps shall be approved type, matching the receptacles for which they are intended, whether or not such receptacles are supplied by the Foodservice or Refrigeration Sub-contractor.
- .2 Make receptacles, junction boxes and breaker panels easily accessible without dismantling equipment.
- .3 Terminate wiring within equipment at load centre or junction boxes with wires identified by Item No. and load.
- .4 Properly rate and ground all receptacles.
- .5 Equip 3-phase motors with magnetic starters with thermal overload protection on each of the three phases.

- .6 Equip single-phase motors of fractional horsepower rating and those ranging up to and including .746 Kw with overload protection. Motors rated over .746 Kw must have magnetic starter with overload protection.
- .7 Control circuits to be 120 V maximum.
- .8 Provide all lighting fixtures for designated equipment with colour corrected lamps and controls or switches wired to an easily accessible common junction box for power connection.
- .9 Fit all portable and mobile electrical equipment with cord and plug suited for the electrical characteristics and outlets specified for the equipment. Include grounding conductor in the cord.

2.4 PLUMBING COMPONENTS

- .1 Plumbing components supplied under this section shall be compatible with materials specified for use on this project. Refer to Division 15.
- .2 All control valves and faucets, pipe fittings, waste and tail pieces etc., must be brass chrome plated, bright finish, new, best quality and comply with applicable codes.
- .3 Valve handles must be of non-conductive materials.
- .4 Faucets, Fisher or T&S Brass equivalent, Inlet Size 12mm IPS.
 - Deck Mount, inlet Centres 102mm, spout 152mm
 - Deck Mount, inlet centres 102mm, spout 152mm.
 - Deck Mount, inlet centres 203mm, or gooseneck
 - Deck Mount, inlet centres 203mm, spout 203mm, 279mm, or gooseneck.
 - Splash Mount, inlet centres 203mm, spout 203mm or 279mm.
 - Splash Mount, inlet centres 203 mm, spout 203mm or 279mm.
 - Provide wrist action handle on all faucets unless specified otherwise.
- .5 Pre-Rinse units, Pot Sink, 19mm IPS Encore Model KN53-5026-12, complete with K50Y-500 swivel arm support, K55-7012 add-on faucet and all attachments including wall brackets for splash mount units.

- .6 Wastes, 38mm or 51mm IPS.
- Centre type, with removable basket strainers and tailpiece, Specialty Hardware model P1.
 - Rotary type stainless steel, Specialty Hardware DSS8000 with strainer.
 - Corner type, with stainless steel overflow, removable strainer and tailpiece.

2.5 MISCELLANEOUS

- .1 Casters to be Darnell, Colson, Kilian or Jarvis black neoprene non-marking rubber tired, 60 shore hardness, doughnut shaped, ball bearing, equipped with brakes as noted, sized to suit specific usage, zinc finished. Plate type shall be securely bolted to frame. Shank casters shall be threaded type c/w bushing. Bushing shall be welded and upright. Bolts, nuts and lock washers shall be stainless steel All casters supplied shall be made by the same manufacturer. Casters shall be supplied on each unit to suit its particular application so that it runs freely and handles easily, minimum of 4" diameter and 200 lbs. capacity per caster.
- .2 Bumpers shall be Colson #6915 for wrap around type set into stainless steel channel and #6927 for corner type c/w a 1.6mm s.s. exterior casing. Secure bumpers on equipment at identical height and seal any exposed gap.
- .3 All sealants shall be one-part silicone type, tackfree in less than one hour with complete cure achieved to 6mm depth in less than 24 hours. Sealant must not significantly alter its properties when set.
- .4 Sealant to remain flexible and resistant to damage from all normal environments of a commercial kitchen. It must not support the growth of bacteria, mould or fungi or discolor.
- .5 Sealant to be clear or as required to suit colour of surrounding materials.

2.6 HARDWARE

- .1 Handles that are an integral part of doors shall be Component Hardware Model P44-1010 full grip stainless steel pulls.
- .2 Handles that are an integral part of drawers shall be Component Hardware Model P44-1010 full grip stainless steel pulls.

- .3 Catches shall be Component Hardware Model M32-2401, concealed magnetic catch with a 30 lb. pull.
- .4 Door track hardware shall be Component Hardware Model B57-0144.
- .5 Door guides shall be Component Hardware Model B62-1093 or equal.
- .6 Door stops shall be Component Hardware Model B60-1086 or equal.
- .7 Front door bypassing door locks shall be Component Hardware Model B58-5513 for non-heated cabinets and B58-5511 for heated cabinets.
- .8 Back door bypassing door locks shall be Component Hardware Model B58-5523 for non-heated cabinets and B58-5521 for heated cabinets.
- .9 Swing door hinge for refrigerator doors shall be Component Hardware Model R42-2840.
- .10 Refrigerator door hardware: Self closing, heavy duty stainless steel offset pivot hinges with magnetic gaskets and 430 stainless steel door frame and tamper proof cylinder locks and two (2) keys per lock.
- .11 Stainless steel drawer slides: Component Hardware Model S52 series for standard and refrigerated units.
- .12 Drawer locks: Component Hardware Model P30 series, stainless steel face (drawers shall not be keyed alike). Supply two (2) keys per lock and hand over to the Owner or Consultant.
- .13 Provide locks on all doors and drawers. Key each section of the foodservices areas with a different series of locks, two (2) keys per lock.
- .14 Casters shall be cadmium plated, steel disc cushion non-marking rubber tired wheels with adjustable cup and cone ball bearings. Caster swivel with two rows of ball bearings running in hardened raceways. Capacity per caster, minimum 100 kg. All stem casters with expanding type fittings of size to suit tube. Plate casters mounted with stainless steel bolts and lock washers for easy replacement. All casters on mobile equipment lubricated for efficient use in varied temperatures of kitchen, walk-in refrigerators and freezers. Casters on mobile equipment equipped with cart-washable casters with grease nipples to assure adequate watertight lubrication.
- .15 Pilaster strips, stainless steel 20mm wide with 13mm adjustment.
- .16 Clips for shelves shall be die formed stainless steel.

2.7 WELDING

- .1 All welding shall conform to the requirements of CSA specifications and be performed by fabricators who are approved by the Canadian Welding Bureau and CSA specifications. Exposed welds shall be filed or ground smooth and flush and polished to match surfaces. All exposed welds shall be continuous.
- .2 Electric seamless welding shall utilize low carbon filler rod, coated with non-carbonaceous flux, with sufficient chromium and nickel so that the deposited metal and the original metal have the same composition.
- .3 Welds shall be free from pits, cracks, discolouration and other imperfections.
- .4 Welded joints shall be butt fitted, properly jigged, continuous, ground smooth and polished for both exposed conditions as well as unexposed welds on underside of equipment.
- .5 Where soldering is desirable, it shall be made with tin-lead solder. In no case shall soldering be relied upon for the stability of the seam or joint. Soldering shall serve only as a filler to prevent leakage and shall not be considered as a replacement for welding or brazing.
- .6 Butt joints made by spot welding or riveting straps under seams and filling with solder, puddle welds and exposed screws are not acceptable.

2.8 FABRICATION

- .1 Before fabrication commences, check all dimensions and conditions at the building site, including means of access into and through the building to the area where equipment is to be set in place, for all conditions affecting the delivery and installation of the equipment.
- .2 Fix and assemble work in the shop wherever possible. Execute the work in accordance with details and shop drawings which have been reviewed and accepted by the Consultant. Where complete or final shop fabrication is not possible, make a trial assembly in the shop prior to delivery.
- .3 Workmanship shall be of the best grade modern shop and field practice for the manufacturers who specialize in this work.
- .4 Fabricate and erect work square, plumb, straight and accurately fitted. Provide adequate reinforcing and anchorage in all places.
- .5 Insulate where necessary to prevent electrolysis.

- .6 All drillings to be reamed and exposed edges left clean and smooth.
- .7 All straight lengths shall be one piece throughout, with all seams, including field joints, continuously welded. Radiused corners must be welded and polished to match original finish.
- .8 Conceal joints and connections wherever possible. Intermediate joints between supports are not acceptable.
- .9 Machine dressed work and finished work shall be free from drag, feathers or roughness of any kind. Remove machine marks by sanding
- .10 Pop rivets shall not be used unless clearly noted on shop drawings, and then only if such drawings have been reviewed and accepted by the Consultant.
- .11 The methods of construction, reinforcement and anchorage, as well as details of finish, fitting and jointing, and other data indicated on shop drawings shall be accurately followed. No deviations from shop drawings which have been reviewed and accepted will be permitted during the construction of equipment or installation.
- .12 The gauge of metal and methods of construction shall in all cases be adequate for the various conditions to be met, with the requirements of the design details and Specifications considered as minimum. Finished equipment shall be rigid when assembled and installed.
- .13 All fastenings and fittings shall be stainless steel, type 302 or 304 unless otherwise specified. All bolts and screws shall have truss heads or flat heads which are properly countersunk, at exterior and interior surfaces which are normally visible. Concealed fastenings shall be used throughout, unless otherwise approved by the Consultant.
- .14 Sheet material for counter tops, tables, shelves and similar forms shall be straight lengths, in one continuous sheet if not over 3 metres long.
- .15 Make provisions in the equipment for proper installation of services and connections. Cut and patch only when necessary. The completed installation shall be properly finished without rough edges or exposed openings.
- .16 Allow for expansion and contraction of materials.
- .17 Obtain samples and confirm sizes of trays, racks, pans and china to determine the exact requirements for openings in equipment.

2.9 CONSTRUCTION

2.9.1 WORKTABLES & COUNTERS

- .1 2.0mm stainless steel continuous sheets all welded.
- .2 Reinforcing shall be a minimum 3.0mm Satin Coat subtop arranged so that forms are concealed from normal view. Secure reinforcing to tops with stud welding and appropriate silicone.
- .3 Table or counters up to 1800mm in length shall have a minimum of 4 legs.
- .4 Tables with sinks shall have a marine edge unless otherwise specified.
- .5 Worktable and counters with sink, work tops to slope towards sinks at a slope of 20mm per metre. For dish tables 8mm per metre toward dishwashing machine. Front edge level over full length.
- .6 Edges shall be as shown and specified in the standard detail 401.
- .7 Kickplates, where specified, shall be of 1.6mm stainless steel and secured to equipment, easily removable.

2.9.2 TOPS

- .1 Stainless steel tops as specified under "Worktables and Counters".

2.9.3 BACKSPLASH

- .1 2.0mm stainless steel fully welded. See Standard Detail 401.
- .2 Integral section of table or counter top turned up on a 19mm radius to the height specified, then boxed or splayed. Refer to Standard Detail 401.
- .3 Enclose, fill and weld all exposed ends and back. Exposed backs at upturns and splashbacks shall be faced with 1.2mm stainless steel back panel to bottom of splashback. Such panels shall be removable as required for access to mechanical and electrical parts. Seal backs to wall with clear silicone.

2.9.4 LEGS AND BRACING

- .1 1.6mm stainless steel wall, 41mm O.D. tubular.
- .2 Provide framework for table tops to maintain a height of 900mm above finished floor.

- .3 Leg spacing maximum 1600mm apart, 760mm front to back.
- .4 Bullet feet, Component Hardware Model A10-0851. When table has service connections, dowel and secure to floor using Component Hardware Model A10-0854. Secure to one set of feet only when bridging a structural expansion joint.
- .5 Braces shall be continuously welded to legs, polished with minimum reduction in volume.
- .6 Cross brace legs in pairs and longitudinal brace at front, centre or back to suit requirements. All set at 250mm above floor.
- .7 Legs shall be continuously welded to s.s. saddles of inverted U shape 100mm wide x 20mm deep x 2.75mm. Flanges angled back or rounded at each end.

2.9.5 OVER-CUPBOARDS

- .1 1.2mm stainless steel all welded
- .2 Top sloped at 30 deg., end gables boxed and bottom shelf fixed.
- .3 Intermediate and adjustable shelves as specified under "Shelving".
- .4 Doors as specified under "Doors" section.
- .5 Secure units to wall with stainless steel fastenings.

2.9.6 SHELVING

- .1 1.6mm stainless steel all welded construction.
- .2 Boxed edges on all four (4) sides. Notch corners to fit contour of legs as required for work tables.
- .3 Shelves with sides or backs shall be turned up 50mm and set to backs or folded if away from walls.
- .4 Shelves shall be easily removable and in sections capable of being pulled out through a single door opening.
- .5 Overshelves to be boxed with backs set to walls and secured with stainless steel tubular brackets.

- .6 Wire shelves to be 5mm O.D. on 25mm centres, set in a 10mm O.D. perimeter frame either stainless steel or heavy duty chrome plated finish as specified.
- .7 Provide a removable bottom shelf in any counter or table set on an enclosed base with mechanical and electrical services.
- .8 Removable bottom shelf in counters or tables with sink for access to clean-out valve on trap.

2.9.7 ANGLE SLIDES

- .1 1.6mm stainless steel construction
- .2 Slides shall be of 50mm x 50mm section, length to suit. Leading corners rounded, fully welded to supports on vertical edge (for fabrication) or secured by no less than four (4) s.s. screws (for millwork)
- .3 Round exposed corners and provide back stops. Mount units in keyhole slots to ease cleaning and removal.
- .4 Back stops to be provided to limit travel.
- .5 Verify tray, pan or basket size to ensure accurate fit.

2.9.8 DRAWERS

- .1 Front shall be double pan construction with insulation equal to cabinet body. Where drawer fronts are shown to have a plastic laminate finish, the double pan construction shall be reversed so that the plastic laminate is contained by the outer edges of the back pan.
- .2 Frames shall be 1.6mm. stainless steel channel, welded to drawer front.
- .3 Pulls shall be formed of stainless steel and welded onto the top edge of drawers; profile shape and size as indicated on the Drawings. Where such formed pulls are not indicated, recessed pulls shall be used, Component Hardware P63-1012 or approved equal.
- .4 Slides for refrigerated cabinets shall be Component Hardware S52 series; for other drawers Component Hardware S26 series as specified under "Hardware".
- .5 All slides to be installed so that drawers are self closing.
- .6 Housing of 1.0mm stainless steel fully enclosed for drawers under worktables and open cabinets.

- .7 Drawers shall accommodate one plastic pan Component Hardware S80 series or one stainless steel pan Component Hardware S81 series for 510 x 510 x 125mm insert.
- .8 Provide rubber buttons at end of frames to cushion drawer.
- .9 Locks as specified under "Hardware".

2.9.9 SINK BOWL

- .1 All of 2.0mm stainless steel integrally welded into table or counter top.
- .2 Interior corners radiused 19mm both vertically and horizontally, all welded and polished. Slope bottom to drain fitting.
- .3 Undercoat with sound deadening compound when sinks are not exposed.
- .4 Multiple sinks to have 18 ga. stainless steel apron to conceal gap between bowls.
- .5 Faucets and drains as specified under "Hardware".

2.9.10 HINGED & SLIDING DOOR

- .1 Front and back of 1.6mm stainless steel.
- .2 All welded, double pan type 19mm thick sound deadened with fibreglass insulation board.
- .3 Hinges for cabinet doors shall be concealed, continuous stainless steel piano type secured to body with stainless steel screws.
- .4 Sliding doors shall be top hung with a stainless steel track mounted above to allow self closing. Provide nylon rollers with ball bearing centre except for heated cabinets where stainless steel rollers shall be used. Doors must be removable without tools.
- .5 Provide rubber buttons to cushion doors.

2.9.11 UNHEATED CABINETS

- .1 Stainless steel tops and backsplash. Top edges boxed, backs up and splayed unless otherwise noted.
- .2 1.2 mm stainless steel body.

-
- .3 Door to be hinged or sliding as required.
 - .4 Stainless steel pilasters for adjustable shelves c/w clips.
 - .5 1.6 mm stainless steel fixed bottom shelf and removable intermediate shelf.
 - .6 Legs as specified under "Legs and Bracing"
- 2.10 PREFABRICATED, INSULATED WALK-IN TYPE REFRIGERATED & FROZEN ROOM ASSEMBLIES - – NOT APPLICABLE FOR THIS CONTRACT**
- 2.10.1 MATERIALS – NOT APPLICABLE FOR THIS CONTRACT**
- 2.10.2 CONSTRUCTION – NOT APPLICABLE FOR THIS CONTRACT**
- 2.11 MECHANICAL REFRIGERATION SYSTEMS – NOT APPLICABLE FOR THIS CONTRACT**
- 2.12 EXHAUST VENTILATORS AND HOODS – NOT APPLICABLE FOR THIS CONTRACT**
- 2.12.1 CONDENSATE HOODS – NOT APPLICABLE FOR THIS CONTRACT**
- 2.13 FIRE SUPPRESSION SYSTEM – NOT APPLICABLE FOR THIS CONTRACT**
- 2.14 ITEMIZED EQUIPMENT SPECIFICATIONS**
- .1 The following numbers correspond to those on the Foodservice Equipment Drawings.
 - .2 Where a manufacturer's name and model number is indicated, the item shall be supplied with all standard components, features and materials whether specifically identified or not, and shall be considered inherent in this specification.
 - .3 Items identified as custom fabricated shall be constructed of stainless steel unless otherwise specified. Refer to detail drawings at the end of this section for general fabrication methods for all items.
 - .4 Verify mechanical and electrical services on existing equipment to be reused. Include in bid all modifications or adjustments to this equipment which are necessary to meet the mechanical and electrical services as shown on plans and specifications.

- .5 Mechanical and electrical characteristics of existing equipment indicated in the schedules are from manufacturers published literature sheets. These are to be considered nominal, or a guide only. Actual mechanical and electrical characteristics of existing equipment must be confirmed by the Foodservice Equipment Sub-contractor.
- .6 Relocate all existing equipment to be reused.
- .7 Visit the existing site to fully examine the scope of work related to the modification and/or refurbishing of existing equipment to be reused.
- .8 Approved alternative manufactures must supply a product that is equal in performance to the specified item.
- .9 Itemized Specification –

BASEMENT LEVEL - DISHROOM

ITEM NO. E.004: S.S. POTWASH TABLE W/THREE SINKS

Quantity: One (1) – Existing to remain

Components:

- K.E.C. to rework left side of dishwash table to suit connection to the new pot wash sink.
- All required cleaning, repairs and commissioning by others.
- Mechanical Divisions to confirm existing service requirements.
- Refer to Drawing QF-100-1 for location.
- To be connected to water filter. Filter system by K.E.C. and installed by Mechanical Division. K.E.C. to coordinate interconnection to filter station with Mechanical Division.

ITEM NO. 1.001: POT AND PAN WASHER

Quantity: One (1) – by K.E.C.
Manufacturer: CHAMPION or equivalent by MEIKO/HOBART
Model: EDI 13

Components:

- Manufacturer's standard components.
- **NOTE: THIS MACHINE MUST BE A VENTLESS POT AND PAN WASHER.**
- 208/60/3 power.
- Complete with water tempering kit.
- Complete with 2 year warranty.

ITEM NO. 1.001A: WATER FILTER ASSEMBLY

Quantity: One (1) – by K.E.C.
Manufacturer: 3M or equivalent by MEIKO/HOBART
Model: HWS050

Components:

- Manufacturer's standard components.
- Complete with brine tank
- Complete with 2 year warranty.

ITEM NO. 1.002: S.S. CLEAN POTWASH TABLE

Quantity: One (1) – By K.E.C.
Manufacturer: CUSTOM FABRICATED
Nominal size: 2,210mm long x 760mm wide x Height to suit pot washer
Type: Custom fabricated s/s construction in accordance with the specification for this section.

Components:

- 14 ga. s.s. top with rolled edge on front as per Detail 401. Edge on left side to suit pot washer.
- Full length 300mm high x 50mm wide integral splash at back and 50mm at right, splayed to wall.
- Legs and side and rear bracing, rear bracing to be flat against the wall to suit undercounter equipment.
- Fabricator to verify dimensions on-site prior to fabrication and confirm location of grease trap to ensure unit will fit below table.
- Refer to Elevation on Drawing QF-200-1.
- Complete with 2 year warranty.

ITEM NO. 1.002A: S.S. WALL SHELVING

Quantity: One (1) – by K.E.C.
Nominal size: 2,210mm long x 300mm wide x one unit high.
Type: Custom fabricated in accordance with the specification for this section

Components:

- Refer to drawings.
- Stainless steel over shelf mounted to wall as per detail 420.
- Fabricator to verify dimensions on-site prior to fabrication.
- Refer to Elevation on Drawing QF-200-1.
- Complete with 2 year warranty.

ITEM NO. 1.003: S.S. WALL PANEL

Quantity: One (1) System – by K.E.C.
Nominal size: Refer to drawing QF-200-1 for size and detail x Height to be from finished floor to underside of ceiling – approximately 4,600mm long
Type: Custom fabricated s/s construction in accordance with the specification for this section.

Components:

- 14 ga. stainless steel wall paneling sealed to the architectural wall from the top of the finished floor to the underside of the ceiling so that they are water tight.
- The stainless steel panels are the run the full length of all the walls in the behind the mop sink.
- Wall panels are to be equal length and to be silicone to the wall and screwed on edges with stainless steel fasteners.
- Edges and fasteners to be concealed with stainless steel “T” strips so that edges and fasteners are concealed and water tight.
- Unit to have stainless steel “Z” strip installed so that the top portion is extended 100mm behind the wall panel. Bottom edges to be concealed with stainless steel “Z” strips so that edges are water tight and extend 38mm over finish floor covings.
- Fabricator to verify dimensions on-site prior to fabrication and allow for services.
- Refer to drawing QF-200-1 for location of wall panel.
- Complete with 2 year warranty.

ITEM NO. 1.004: HAND SINK

Quantity: Two (2) – By K.E.C.
Manufacturer: EAGLE or equivalent by TARRISON
Model: HSA-10-FA-P

Components:

- Manufacturer's standard components.
- Complete with P-Trap.
- Complete with MICROGARD protection.
- Complete with Rubbermaid 1971258 bin (Colour to be grey) with 2673-60 swing top.

LEVEL 4 SERVERY

ITEM NO. E.002: JUICE DISPENSER

Quantity: One (1) – Existing to be relocated by K.E.C.

Components:

- All required cleaning, repairs and commissioning by others.
- Electrical and Mechanical Divisions to confirm existing service requirements.
- Refer to Drawing QF-100-1 for location.

ITEM NO. E.003: SPECIALITY COFFEE DISPENSER

Quantity: One (1) – Existing to be relocated by K.E.C.

Components:

- All required cleaning, repairs and commissioning by others.
- Electrical and Mechanical Divisions to confirm existing service requirements.
- Refer to Drawing QF-100-1 for location.

ITEM NO. E.004: REACH-IN REFRIGERATOR

Quantity: One (1) – Existing to be relocated by K.E.C.

Components:

- All required cleaning, repairs and commissioning by others.
- Electrical Divisions to confirm existing service requirements.
- Refer to Drawing QF-100-1 for location.

ITEM NO. E.005: 5-WELL HOT FOOD STATION

Quantity: One (1) – Existing to be relocated by K.E.C.

Components:

- All required cleaning, repairs and commissioning by others.
- Electrical and Mechanical Divisions to confirm existing service requirements.
- Refer to Drawing QF-100-1 for location.

ITEM NO. E.006: ELECTRIC CONVEYOR TOASTER

Quantity: One (1) – Existing to be relocated by K.E.C.

Components:

- All required cleaning, repairs and commissioning by others.
- Electrical Divisions to confirm existing service requirements.
- Refer to Drawing QF-100-1 for location.

ITEM NO. E.007: CART, UTILITY

Quantity: One (1) – Existing to be relocated by K.E.C.

Components:

- All required cleaning, repairs and commissioning by others.
- Refer to Drawing QF-100-1 for location.

ITEM NO. E.008: PORTABLE HAND SINK W/SINGLE BOWL

Quantity: One (1) – Existing to be relocated by K.E.C.

Components:

- All required cleaning, repairs and commissioning by others.
- Electrical and Mechanical Divisions to confirm existing service requirements.
- Refer to Drawing QF-100-1 for location.

ITEM NO. 2.001: DROP-IN HOT/COLD WELLS

Quantity: One (1) – by K.E.C.
Manufacturer: WELLS
Model: MOD400TDMAFS

Components:

- Manufacturer's standard components.
- Complete with one (1) set full-size 6" (152mm) high S.S. insert pans with lids.
- Complete with drain valve extension kit.
- Complete with drain screen.
- Complete with optional 72" wiring.
- Complete with automatic water fill with single control panel.
- Remote digital controller, to be recessed in S.S. apron,.
- KEC must coordinate ventilation with millwork fabricator, to ensure drop-in well manufacturer's operating requirements are met.

ITEM NO. 2.002: FOOD SHIELD

Quantity: One (1) – by K.E.C.
Manufacturer: IFAB
Model: FS-101

Components:

- Manufacturer's standard components.
- Complete with one (1) HATCO GRAH-24 heat lamp with built in variable control complete with stainless steel housing mounted to the sneeze guard. Housing complete with led lights with built in switch.
- Complete with one (1) HATCO GRAH-54 heat lamp with built in variable control complete with stainless steel housing mounted to the sneeze guard. Housing complete with led lights with built in switch.
- Heat/Light sections to be installed over Hot Wells.
- Wiring exit point to be confirmed on site to match rough-ins on site.
- Complete with one LED light section with built in control complete with stainless steel housing mounted to the sneeze guard. Housing complete with led lights with built in switch.
- 50mm U shaped round diameter posts. Installed over hot food well
- #4 Brushed Aluminium finish.
- 1/2" Tempered Glass front.

- 1/2" tempered glass top.
- Top mount heavy duty mount flanges.
- Manufactured in two (2) sections one 1,750mm long over the 4 wells. Section in front of 2 well and plate dispenser is to be 1,450mm long.
- Two (2) end posts and one intermediate post for food wells section.

ITEM NO. 2.002A/B: HEAT LAMPS

Quantity: Two (2) – By K.E.C.

Components:

- Refer to specification 2.002.

ITEM NO. 2.003: S.S. TABLE

Quantity: One (1) – by K.E.C.

Nominal size: 4,100mm long x 1070mm wide x865mm high

Type: Custom fabricated s/s construction in accordance with the specification for this section.

Components:

- Construct as cabinet base c/w enclosed sides and front. Front panels to have plam finish. (final laminate to be confirmed with architect prior to ordering.)
- Unit top be constructed to suit roll down shutter. Note that the top to extend pass the wall to serve as landing surface.
- Complete with stainless steel apron for mounting of controls. Apron complete with bumpers to protect control panel knobs.
- Unit complete with solid base, 150mm legs and adjustable flanged feet complete with removable kickbase on front and back.
- Complete with 3 drawer unit as per detail on drawing QF-300-1
- Provide all necessary service openings for connection of services to equipment. (KEC to coordinate the location of all penetration with trades)
- Provide S.S. grommets to conceal all openings for services.
- Stainless steel panels as required to conceal mechanical and electrical services from architectural wall.
- Complete with sliding doors below wells and hinged door below beverage equipment and plate dispenser.
- Doors to have ventilation for drop in equipment.

- Complete with drip tray under beverage equipment.
- Fabricator to verify dimensions on site prior to fabrication.
- Refer to Elevation on Drawing QF-200-1.

ITEM NO. 2.003A: DRIP TRAY

Quantity: One (1) – By K.E.C.

Components:

- Refer to specification 2.003.

ITEM NO. 2.004: DUAL TEMPERATURE PANS

Quantity: One (1) – by K.E.C.

Manufacturer: WELLS

Model: HRCP-7200

Components:

- Manufacturer's standard components.
- Complete with 2-year parts and labor warranty.
- Complete with 5-year compressor warranty.
- Complete with perforated bottom strainer plate.
- Complete with one (1) set full-size 6" (152mm) high S.S. insert pans and adaptor bars.
- Remote digital controller, to be recessed in S.S. apron,.
- KEC must coordinate ventilation with millwork fabricator, to ensure drop-in well manufacturer's operating requirements are met.

ITEM NO. 2.005: SPARE NUMBER

ITEM NO. 2.006: SPARE NUMBER

ITEM NO. 2.007: ELECTRIC CONVEYOR TOASTER

Quantity: One (1) – By K.E.C.
Manufacturer: HATCO or equivalent by TOASTMASTER
Model: TQ-800

Components:

- Manufacturer's standard components.
- Automatic power save mode.
- Complete with 2 year warranty.

ITEM NO. 2.008: DROP-IN DISH DISPENSER, HEATED

Quantity: One (1) – By K.E.C.
Manufacturer: APW or equivalent by HATCH
Model: HL-10

Components:

- Manufacturer's standard components.
- Confirm plate size with owner prior to ordering.
- Complete with 2 year warranty.

PART 3 - EXECUTION

3. EXECUTION

3.1 SITE INSPECTIONS

- .1 All dimensions shown on the Drawings or listed in this Section of the Specification are to be considered nominal and for guidance only. It is the responsibility of the Foodservice Equipment Sub-contractor to check dimensions on the site and to co-ordinate any adjustments which may be necessary for the proper fabrication and set-in-place of the foodservice equipment.
- .2 If significant variances are apparent to the General Contractor or Foodservice Equipment Sub-contractor which may require changes affecting the intent of the contract, immediately notify the consultant.
- .3 Fabricate equipment in sections that will allow easy access into the building and to final location within the foodservice area. Any damage to the building or the equipment will be the Foodservice Equipment Sub-contractor's responsibility.
- .4 Verify on the job site all actual dimensions of storerooms and walk-in refrigerators and freezers and adjust if necessary the size of shelving units specified in the item specification.
- .5 Verify all points of access into the job site and ensure that all pieces of equipment or fabricated items installed or relocated are able to pass through doors, hallways etc. in order to arrive at designated location on plans.

3.2 SAMPLES

- .1 If requested by the Consultant, submit samples of components or fabrication methods, materials or finishes, for review and approval before proceeding with that aspect of the work. Where necessary, request a shop inspection of an assembly which cannot be submitted for approval. Include in the base bid price, the cost of samples which may be rejected.
- .2 Samples must be the precise articles proposed to be furnished.
- .3 All samples must be supplied in the required quantity and all except one (1) will be returned.
- .4 Reviewed samples will become the standard of workmanship and material against which installed work will be checked.

- .5 Obtain from the Owner, all necessary samples of china, baskets, trays, etc. to determine proper sizes for openings, angle slides dispensers, dishmachines, etc.
- .6 Prior to ordering dishwashing equipment, obtain from the Owner a sample of all service wares, trays etc. and assure their compatibility with warewashing or cartwashing equipment.

3.3 DELIVERY STORAGE OF EQUIPMENT

- .1 The Foodservice Equipment Sub-contractor will coordinate deliveries of equipment in conjunction with construction activity and progress at the site and as dictated by the Owner.
- .2 The Foodservice Equipment Sub-contractor shall obtain and/or hold equipment ready for delivery in accordance with an agreed schedule which will permit completion of the work at the specific date.
- .3 Deliver, unpack and set in place all equipment in the designated position, ready for final connection of services, for units with electrical or mechanical connections.
- .4 Supply to the Owner, in sufficient time, any information or items of service, articles, components or equipment which requires building in or which may overlap or impede the work of others.
- .5 Provide all necessary information within adequate time and in proper sequence regarding the exact location of openings, chases and any attachments or other fittings required for foodservice equipment.
- .6 Supply and deliver to the site in sufficient time all inserts, anchors, bolts, sleeves, ferrules and similar items for attaching to, or building into, masonry, concrete and other work for the proper anchorage and fixing of the equipment. Include necessary templates, instructions, directions and/or assistance in the location and installation of all items by other Sub-contractors.

3.4. INSTALLATION

- .1 Supply to all other trades in sufficient time, any services, articles, or equipment that require “building-in” or overlapping coordination. Also notify exact locations of openings, chases, anchors, floor pan, etc., required for the foodservice equipment covered in this contract.
- .2 Caulk and seal equipment to walls, base pads, curbs, and adjacent equipment where required.
- .3 Leave installed work neat, cleaned and polished, well fitted into position, level, and in proper operating condition.
- .4 Promptly remove all rubbish and debris from the building and site as the work proceeds and on completion.
- .5 Activate, test and adjust all equipment and apparatus installed under this Contract. Refinish and repair any painted and finished surfaces damaged during erection and installation. Hand over the completed installation in first class condition and working order.
- .6 Ensure electrical equipment is accompanied by label or certification of approval by Canadian Standards Association, Hydro Electrical Power Commission or Local Authority.
- .7 Finished work must be perfectly true and plumb with no warping, buckling or open seams. All edges, hidden or exposed must be ground smooth and rounded. Rivet heads, weld marks, or other imperfections are not acceptable.
- .8 Cutting and repairs for the proper installation of services are part of the work in this Contract.
- .9 Obtain permits or special inspections. No allowance will be made for costs incurred.

- .10 Identify equipment with metal plates or labels permanently secured which include, where applicable:
- Manufacturer's name or recognized trademark
 - Complete model identification
 - Model, serial number and CSA U.L.C. and NSF identifications
 - Electrical characteristics
 - Direction of drive
 - Controls
 - Circuits, lines, etc.
 - Specific operating instructions
- .12 Identify equipment with temporary labels showing location and Item number per Specifications.
- .13 After installation has been completed and all items checked and adjusted where necessary for satisfactory operation, arrange for inspection of equipment. If items are found unsatisfactory, make necessary corrections and adjustments.

3.5 PROTECTION AND CLEANING

- .1. Protect properly and efficiently all work against any damage. Repair without charge to the Owner any damage to equipment and/or building. Cooperate at all times to keep the area clean and free of all rubbish and debris. At the end, clean all equipment to permit immediate use by the Owner without further cleaning.
- .2. In areas where quarry tile is applied as a floor finish, ensure that no stainless steel is present if Muriatic Acid is being used to clean the tiles.

3.6 MAINTENANCE MANUALS

- .1 Supply four (4) sets of manuals, bound and labeled, incorporating operating and maintenance instructions, including spare parts list and optional accessories for all items specified.
- .2 Identify each item, arrange in proper sequence and ensure that the numbers correspond to the specifications and drawings.

- .3 Provide an itemized lead sheet at the front of the manual with a list of the contents and the name and phone number of the service company.

3.7 DEMONSTRATION

- .1 After completion of installation, cleaning, testing and final inspection, instruct the Owner or their authorized personnel in the correct operation and maintenance of the equipment.
- .2 A demonstration shall be made of each piece of equipment requested by the Consultant, and such demonstration shall be carried out by a competent representative of the manufacturer's equipment.
- .3 It is the responsibility of the General Contractor and/or Foodservice Equipment Sub-contractor to correct deficiencies and make adjustments to items which are not functioning properly at the time of demonstration.
- .4 The Contractor shall co-ordinate the schedule for equipment demonstrations with the Owner representative, with adequate time allowed for each demonstration.
- .5 Submit to the Foodservice Consultant three (3) weeks prior to completion of the installation, cleaning, final inspection and testing, a schedule of demonstration by the suppliers of purchased equipment. Indicate clearly the timing for each supplier to start up and demonstrate the proper use and maintenance of their equipment to the Owner.
- .6 The Consultant will inspect equipment on substantial completion of work and will issue a deficiency report immediately thereafter. A final inspection will also be made to verify corrected deficiencies.
- .7 The Owner reserves the right to inspect equipment at the factory of the Foodservice Equipment Sub-contractor, or at other locations as necessary.
- .8 Rejection of any item of equipment, components or fabrication will be based on degree of conformance to the Specification and Drawings, and is subject to the Conditions of the contract in any matter of dispute.

3.8 GUARANTEE

- .1 All new equipment shall be guaranteed for a minimum of **two (2) years** from the date of acceptance against defects in material, manufacture, assembly, labour and installation. Those items or components which have inherent guarantee periods beyond this minimum shall be sustained to the maximum time provided by the manufacturer.

- .2 This guarantee applies to new purchases and fabricated equipment specified under this Division. Repair and/or replace at no cost to the Owner, parts and labour included, any and all equipment covered in this contract, which proves defective within the guarantee period.
- .3 The two (2) year warranty shall include service, inspection, and maintenance for the fire extinguishing system as requested by the national and/or local authorities and N.F.P.A. - Code 96.
- .4 All mechanical refrigeration system components including compressors, condensing units, be supplied with a five (5) year replacement guaranteed including parts. All labour for mechanical refrigeration system components shall be supplied with a one (1) year guarantee.
- .5 If defects become apparent during the guarantee period they shall be made good by the Foodservice Equipment Sub-contractor/supplier or authorized service representative. The supplier means the manufacturer of the equipment item, but under all circumstances it is the responsibility of the General Contractor/Foodservice Equipment Sub-contractor to maintain the obligation of guarantee whether or not the supplier provides this service.
- .6 If defects identified at any time during the 2 year warranty period are not corrected prior to expiration of the warranty period, the warranty period will automatically be extended until the defect is corrected to the "Owners" or "Consultants" satisfaction.
- .7 If deficiencies identified at the point of substantial completion of the food equipment installation or during the two (2) year warranty period are not corrected or resolved prior to the expiration of the two (2) year warranty period, the warranty period will automatically be extended until such time as the outstanding deficiency is corrected to the "Owners" or "Consultants" satisfaction.
- .8 The guarantee shall not apply where it can be clearly shown that a defect or malfunction is due to misuse or neglect by the Owner or their representatives.
- .9 The guarantee period shall commence upon acceptance of the equipment by the Owner, or such date(s) as may be mutually agreed upon after substantial completion of the work. In no event shall the period of guarantee begin later than the date upon which the lien holdback expires.

3.9 INSPECTION, REJECTION AND FACTORY TESTING

- .1 The Owner and Consultant reserve the right to inspect the fabrication of any items at the fabricating plant and they may reject any equipment which does not comply with Plans and/or Specifications. The Contractor will replace without charge all rejected material or equipment within (10) days of rejection.

- .2 Factory test and verify all items such as cold pans, refrigerated display cases, ice cream freezers, custom built refrigerators, etc., to be sure that they are in proper working order before shipment. Inform the Consultant of the date of these tests in advance in writing so that he may observe and inspect these items in the ship if necessary. Advise the Consultant when installation is complete and ready for inspection.

SUB TOTAL FOOD SERVICE EQUIPMENT \$ _____

DELIVERY, UNCRATING AND SET-IN PLACE \$ _____

MISCELLANEOUS S.S. TRIM ETC. \$ 1500.00

APPLICABLE PROVINCIAL SALES TAX \$ _____

TOTAL FOOD SERVICE EQUIPMENT \$ _____

4.2 ACCEPTABLE ALTERNATIVE EQUIPMENT

The following are prices for alternative equipment listed hereunder. Such alternative equipment and amounts are NOT included in the base bid stipulated price.

ITEM NO.	DESCRIPTION	ALTERNATIVE MANUFACTURER	UNIT PRICE	ADDITION TO OR DEDUCTION FROM BASE TENDER PRICE
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4.3 OTHER PREAPPROVED ACCEPTABLE ALTERNATIVE MANUFACTURERS

The following are prices for alternative equipment listed hereunder that has been pre-approved. Such alternative equipment and amounts are NOT included in the base bid stipulated price.

ITEM NO.	DESCRIPTION AND MODEL NO.	ALTERNATIVE MANUFACTURER	UNIT PRICE	ADDITION TO OR DEDUCTION FROM BASE TENDER PRICE
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