



**Ground Floor Service  
Peterborough City Hall Renovation  
500 George St. North, Peterborough, ON.**

**Project 23172**

**DATE** March 26, 2024



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M201	Ground Floor North Wing New Mechanical	3	-	March 18, 2024
M202	Ground Floor South Wing New Mechanical	3	-	March 18, 2024
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**LIST OF DRAWINGS**  
Section 01 00 60

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End of Section

## PART 1 GENERAL

### 1.1 Section Includes

- .1 Work covered by Contract Documents
- .2 Owner
- .3 Place of the Work
- .4 Site access
- .5 Work sequence
- .6 Contractor use of premises
- .7 Engineer design
- .8 Designated substances: ACM and others
- .9 Verification
- .10 Building smoking environment
- .11 Special conditions
- .12 Site security
- .13 "By Others"
- .14 Protection of Drawings

### 1.2 Work Covered by Contract Documents

- .1 Work of this Contract comprises the **Ground Floor Service, Peterborough City Hall Renovations** as indicated on the Contract Drawings and Specifications.

### 1.3 Owner

- .1 City of Peterborough

### 1.4 Place of the Work

- .1 The Work of this Contract is located at 500 George Street North, Peterborough, Ontario.

### 1.5 Site Access

- .1 Access to the site to be arranged by the Owner.
- .2 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

### 1.6 Work Sequence

- .1 Construct Work continuously.

### 1.7 Contractors Use of Premises

- .1 Contractor has restricted use of site until Substantial Performance.

### 1.8 Engineer Design

- .1 Where specifications require Work to be designed by an engineer, engage an engineer licensed in the Province of Ontario to design such Work.

1.9 Designated Substances: ACM and Others

- .1 The Owner shall provide any prospective constructor or contractor a copy of building ACM surveys and information on designated substances that are known or suspected of being present within the area or scope of work.
- .2 The General Contractor shall ensure that a copy of the ACM survey is provided to each contractor and subcontractor who will be working on the Project.
- .3 Any findings of undeclared ACM, or damaged ACM that could pose a risk to workers is to be brought to the attention of the Owner immediately, and work is to be stopped.
- .4 All project design and construction activities must be carried out in compliance with the Regulations.
- .5 No asbestos-containing materials, as defined by O. Reg. 278/05, may not be specified or used in any project.

1.10 Verification

- .1 All dimensions shall be verified on site, and all necessary modifications and adjustments shall be made as necessary to suit.

1.11 Building Smoking Environment

- .1 Smoking and vaping are prohibited in all work places within the Owner's buildings and on the Owner's property.

1.12 Special Conditions

- .1 The following general and special conditions apply:
  - .1 All existing surfaces and finishes are to be repaired wherever damaged during the course of the Work.
  - .2 Wherever existing floor and wall finishes are to be removed, include full removal down to the existing substrate of all tile, base, mortars, grouts, waterproofing membranes and adhesives in accordance with TTMAC recommended procedures. Patch and repair existing substrate to the quality required by the new finish material manufacturer for the installation of their products.
  - .3 All openings in existing fire rated assemblies or fire separations which are created by the removal of existing services, plumbing, conduit, ductwork, fittings fixtures or accessories are to be firestopped to maintain the integrity of the existing construction.
  - .4 All exposed interior surfaces except prefinished surfaces shall be painted whether referred to in the specifications and drawings or not.

1.13 Site Security

- .1 Daily Inspection: Provide inspection of the work areas daily while the work is in progress and take whatever measures are necessary to secure the construction zones from theft, vandalism and unauthorized entry.

1.14 "By Others"

- .1 The term "by others" where it is used in the contract documents means that work shown or

described in the contract documents and labeled with this designation is not included in the specific sub-trade's scope of work but will be required to be done within the General Contractor's contract.

**1.15 Use of Drawings**

- .1 Drawings are not to be scaled.
- .2 Copies of architectural and structural "issued for construction" drawings in digital format will be made available for the contractors use under the following conditions.
  - .1 Copyright remains with BBA.
  - .2 The drawings will only be used for shop drawings for this project and not be put to any other use.
  - .3 BBA assumes no liability for errors or omissions in the drawings. The Contractor assumes all risk and expenses associated with the use of drawings in the production of his work.
  - .4 References to BBA and other Consultants must be deleted from the title block.
  - .5 The Contractor signs a release available from BBA that addresses the above items in more detail. (Sample attached as Appendix 'A')
- .3 Arrangements for use of sub-consultant drawings must be made with the appropriate sub-consultant.

**1.16 Protection of Drawings**

- .1 Copyright of electronic document belongs to the Consultant. Electronic documents may not be forwarded to others, transmitted, downloaded or reproduced in any format, whether print or electronic, without the express, written permission of the copyright owner.
- .2 Drawings, specifications and other contract related documents which are posted on Contractor controlled websites for access by sub-trades and suppliers, shall be posted only on password expressed interest in the Project.
- .3 Provide Consultant and Owner with access to such websites as noted above.

**PART 2 PRODUCTS**

**3.1 Not Used**

- .1 Not used

**PART 3 EXECUTION**

**3.2 Not Used**

- .1 Not used

End of Section

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PART 1 GENERAL

1.1 Section Includes

- .1 Cash Allowances

1.2 References

- .1 Canadian Construction Documents Committee CCDC2-2020 Stipulated Price Contract including the Supplementary Conditions.

1.3 Cash Allowances

- .1 Refer to General Conditions, GC4.1.
- .2 Unless otherwise specified, Cash Allowances shall cover the cost of the materials and equipment delivered F.O.B. job site, and all applicable taxes, except Harmonized Sales Tax. The Contractor's handling costs on the site, labour, installation costs, overhead and profit and other expenses shall be included separately in the Stipulated Price and not in the Cash Allowance.
- .3 Where it is specified that a Cash Allowances is to include both supply and installation costs, such allowances shall cover the cost of the materials and equipment delivered and unloaded at the site, all applicable taxes and the contractor's handling costs on the site, labour and installation costs and other expenses, except overhead and profit which shall be included separately in the Stipulated Price.
- .4 If the cost of the Work covered by Cash Allowances, when determined, is more or less than the allowance, the Contract Sum shall be adjusted accordingly.
- .5 In the event that the cost of the work covered by Cash Allowances should exceed the cash allowance, while the Contract Sum will be adjusted in conformity therewith, there shall be no adjustment to the Contractor's fee or other expenses such as overhead or profit, it being understood and agreed that the contract sum includes the Contractor's expenses and profit for all Cash Allowances whether or not they are exceeded.
- .6 Progress payments on accounts of work authorized under Cash Allowances shall be included in monthly certificate for payment.
- .7 Expenditures from Cash Allowances shall be authorized by Site Instruction, Change Directive or Change Order.
- .8 Cash Allowance for independent inspection and testing shall cover the cost of such services as provided by independent testing agency only. The Contractor's cost for labour, overhead and other expenses related to independent inspection and testing shall be included separately in the Stipulated Price and not in the Cash Allowance.
- .9 Cause the work covered by Cash Allowances to be performed for such amounts and by such persons as the Consultant may select and direct or as required by the project drawings and specifications.

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ALLOWANCES  
Section 01 21 00

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PART 2 PRODUCTS

2.1 Not Used

.1 Not used

PART 3 EXECUTION

3.1 Not Used

.1 Not used

End of Section

## PART 1 GENERAL

### 1.1 Section Includes

- .1 Requests for Information.
- .2 Submittal Procedures.
- .3 Screening of RFI's.
- .4 Response to RFI's.
- .5 Response Timing.

### 1.2 Request for Information (RFI)

- .1 A request for information (RFI) is a formal process used during the Work to obtain an interpretation of the Contract Documents or to obtain additional information.
- .2 An RFI shall not constitute notice of claim for a delay.

### 1.3 Submittal Procedures

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Number RFI's consecutively in one sequence in order submitted, in numbering system as established by the Contractor.
- .3 Submit one distinct subject per RFI form. Do not combine unrelated items on one form.
- .4 RFI Form:
  - .1 Submit a draft "Request for Information" form to be approved by the Owner and Consultant.
  - .2 Submit RFI's to the Consultant on approved "Request for Information" form. The Consultant shall not respond to an RFI except as submitted on this form.
  - .3 Where RFI form does not have sufficient space to provide complete information thereon, attach additional sheets as required.
  - .4 Submit with RFI form all necessary supporting documentation.
- .5 RFI Log:
  - .1 Maintain log of RFI's sent to and responses received from the Consultant, complete with corresponding dates.
  - .2 Submit updated log of RFI's at each construction meeting.
- .6 Submit RFI's sufficiently in advance of affected parts of the Work so as not to cause delay in the performance of the Work. Costs resulting from failure to do so will not be paid by the Owner.
- .7 Only the Contractor shall submit RFI's to the Consultant.
- .8 RFI's submitted by Subcontractors or Suppliers directly to the Consultant will not be accepted.

### 1.4 Screening of RFI's

- .1 Contractor shall satisfy itself that an RFI is warranted by undertaking a thorough review of the Contract Documents to determine that the claim, dispute, or other matters in question relating to the performance of the Work or the Interpretation of the Contract Documents cannot be resolved by direct reference to the Contract Documents. Contractor shall describe in detail this review on the RFI form as part of the RFI submission. RFI submittals that lack such detailed review

description, or where the detail provided is, in the opinion of the Consultant, insufficient, shall not be reviewed by the Consultant and shall be rejected.

1.5 Response to RFI's

- .1 Consultant shall review RFI's from the Contractor submitted in accordance with this section with the following understandings:
  - .1 Consultant's response shall not be considered as a Change Order or Change Directive, nor does it authorize changes in the Contract Price or Contract Time or changes in the Work.
  - .2 Only the Consultant shall respond to RFI's. Responses to RFI's received from entities other than the Consultant shall not be considered.

1.6 Response Timing

- .1 Allow 5 Working Days for review of each RFI by the Consultant.
- .2 Consultant's review of RFI commences on date of receipt of RFI submission by the Consultant from Contractor and extends to date RFI returned by Consultant.
- .3 When the RFI submission is received by Consultant before noon, review period commences that day. When RFI submittal is received by Consultant after noon, review period begins on the next Working Day.
- .4 If, at any time, the Contractor submits a large enough number of RFI's or the Consultant considers the RFI to be of such complexity that the Consultant cannot process these RFI's within 5 Working Days, the Consultant will confer with the Contractor within 3 Working Days of receipt of such RFI's, and the Consultant and the Contractor will jointly prepare an estimate of the time necessary for processing same as well as an order of priority among the RFI's submitted. The Contractor shall accommodate such necessary time at no increase in the Contract Time and at no additional cost to the Owner.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Not Used

- .1 Not used

End of Section

## PART 1 GENERAL

### 1.1 Section Includes

- .1 Preconstruction Conference
- .2 Project Meetings
- .3 On Site Documents
- .4 Cost Breakdown

### 1.2 Preconstruction Conference

- .1 The Consultant will call for and administer a Preconstruction Conference at time and place to be announced.
- .2 Contractor, all major Subcontractors, and major suppliers shall attend the Preconstruction Conference.
- .3 Agenda will include, but not be limited to, the following items.
  - .1 Lines of communication and contact information
  - .2 Submittal and RFI procedures
  - .3 Schedules
  - .4 Personnel and vehicle permit procedures
  - .5 Use of premises
  - .6 Location of any Contractor on-site facilities
  - .7 Security
  - .8 Housekeeping
  - .9 Inspection and testing procedures, on-Site and off-Site
  - .10 Control and reference point survey procedures
  - .11 Health and safety
  - .12 Contractor's Schedule of Values
  - .13 Contractor's Schedule of Submittals
- .4 The Consultant will distribute copies of minutes to attendees. Attendees shall have seven days to submit comments or additions to minutes. Minutes will constitute final documentation of results of Preconstruction Conference.

### 1.3 Project Meetings

- .1 The Contractor will arrange project meetings and assume responsibility for setting times and recording and distributing minutes.
- .2 Meetings will be held minimum bi-weekly.

### 1.4 On-Site Documents

- .1 Maintain at job site, one copy each of the following:
  - .1 Contract drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Reviewed shop drawings.
  - .5 Requests for Information (RFI's)
  - .6 Change orders.
  - .7 Other modifications to Contract.

- .8 Field test reports.
- .9 DSS reports
- .10 Approved Work schedule.
- .11 Manufacturers' installation and application instructions.
- .12 Safety Data Sheets (SDS).
- .13 Health and Safety Plan and other safety related documents.
- .14 Other documents as specified.

1.5 Cost Breakdown

- .1 Submit a detailed cost breakdown to Consultant at least ten working days prior to the submission of the first progress claim. After approval by Consultant the cost breakdown will be used as basis for progress payment.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Not Used

- .1 Not used

End of Section

## **PART 1 GENERAL**

### **1.1 Section Includes**

- .1 Submittals.
- .2 Schedules.
- .3 Format.
- .4 Submission.
- .5 Critical Path Scheduling.
- .6 Submittals Schedule.

### **1.2 Submittals**

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

### **1.3 Schedules Required**

- .1 Submit schedules as follows:
  - .1 Construction Progress Schedule.
  - .2 Submittal Schedule for Shop Drawings and Product Data.
  - .3 Submittal Schedule for Samples.
  - .4 Product Delivery Schedule.
  - .5 Cash Allowance Schedule for purchasing Products or Services.
  - .6 Shutdown or closure activity.

### **1.4 Format**

- .1 Prepare schedule in form of a horizontal bar chart using Microsoft Project 2016 or later.
- .2 Provide a separate bar for each major item of work, trade or operation.
- .3 Split horizontally for projected and actual performance.
- .4 Provide horizontal time scale identifying first work day of each week.
- .5 Format for listings: chronological order of start of each item of work.
- .6 Identification of listings: By Systems description.

### **1.5 Submission**

- .1 Submit initial format of schedules within 10 working days after award of Contract.
- .2 Submit schedules in electronic format, by email as PDF files.
- .3 Consultant will review schedule and return reviewed copy within 10 days after receipt.
- .4 Resubmit finalized schedule within 7 days after return of reviewed copy.
- .5 During progress of Work revise and resubmit schedule as directed by Consultant.
- .6 Submit revised progress schedule with each application for payment.

- .7 Distribute copies of revised schedule to:
  - .1 Job site office.
  - .2 Subcontractors.
  - .3 Other concerned parties.
  - .4 Instruct recipients to report to Contractor within 10 days, any problems anticipated by timetable shown in schedule.
- .8 Table current and up to date schedule at each regular site meeting.

#### 1.6 Critical Path Scheduling

- .1 Include complete sequence of construction activities.
- .2 Schedules shall represent a practical plan to complete the work within the Contract period, and shall convey the plan to execute the work. Schedules as developed shall show the sequence and interdependencies of activities required for complete performance of the work.
- .3 The submittal of schedules shall be understood to be the Contractor's representation that the schedule meets the requirements of the Contract Documents and that the work will be executed in the sequence and duration indicated in the schedule.
- .4 Failure to include any element of work required for performance of the Contract or failure to properly sequence the work shall not excuse the Contractor from completing all work within the Contract Time.
- .5 All schedules shall be developed utilizing industry standard 'best practices' including, but not limited to:
  - .1 No open-ended activities.
  - .2 No use of constraints other than those defined in the Contract Documents without the prior approval of the Consultant.
  - .3 No negative leads or lags.
  - .4 No excessive leads or lags without prior justification and approval from the Consultant.
  - .5 For individual schedule construction activities, do not exceed 14 days in duration without prior approval of the Consultant. Subdivide activities exceeding 14 days in duration to an appropriate level.
  - .6 Sufficiently describe schedule activities to include what is to be accomplished in each work area. Express activity durations in whole days. Clearly define work that is to be performed by subcontract.
  - .7 Create the schedule in conformance with the work-hours and constraints set forth in these Contract Documents.
- .6 Include dates for commencement and completion of each major element of construction.
- .7 Show projected percentage of completion of each item as of first day of month.
- .8 Indicate progress of each activity to date of submission schedule.
- .9 Show changes occurring since previous submission of schedule:
  - .1 Major changes in scope.
  - .2 Activities modified since previous submission.
  - .3 Revised projections of progress and completion.
  - .4 Other identifiable changes.

- .10 Provide a narrative report to define:
  - .1 Problem areas, anticipated delays, and impact on schedule.
  - .2 Corrective action recommended and its effect.
  - .3 Effect of changes on schedules of other prime contractors.

1.7 Submittals Schedule

- .1 Include schedule for submitting shop drawings, product data, and samples. Indicate manufacture and delivery lead times into the shop drawing submittal schedule.
- .2 Indicate dates for submitting, review time, resubmission time, and last date for meeting fabrication schedule.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Not Used

- .1 Not used

End of Section

## PART 1 GENERAL

### 1.1 Section Includes

- .1 Administrative
- .2 Requests for Information
- .3 Shop Drawings and Product Data
- .4 Interference Drawings
- .5 Progress Photographs
- .6 Samples
- .7 Mock-Ups
- .8 Certificates and Transcripts

### 1.2 Administrative

- .1 Submit to Consultant submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Work affected by submittal shall not proceed until review is complete.
- .3 Present shop drawings, product data, samples and mock-ups in metric units.
- .4 Where items or information is not produced in metric units converted values are acceptable.
- .5 Review submittals prior to submission to Consultant. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- .6 Notify Consultant in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Verify field measurements and affected adjacent work are coordinated.
- .8 Contractor's responsibility for errors and omissions in submission is not relieved by Consultant's review.
- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Consultant's review.
- .10 Keep one reviewed copy of each submission on site.

### 1.3 Requests for Information (RFI's)

- .1 Refer to Section 01 26 15 – Requests for Information

### 1.4 Shop Drawings and Product Data

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures, product data and other data which the Contractor provides to illustrate details of a portion of Work.

- .2 Coordinate each submission with requirements of Work and Contract Documents. Individual submissions will not be reviewed until all related information is available.
- .3 Submit shop drawings bearing stamp and signature of qualified professional Engineer registered or licensed in the Province of Ontario where required by the individual specification sections. Each submittal and each resubmittal must bear the stamp of the Engineer
- .4 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .5 Prior to submission to Consultant, review all submitted drawings. By this review, Contractor represents to have determined and verified field measurements, site conditions, materials, catalogue number and similar data and to have checked and coordinated each drawing with the requirements of Work and of Contract Documents. Contractor's review of each drawing shall be indicated by stamp, date and signature of a responsible person.
- .6 At time of submission, notify Consultant in writing of any deviations in drawings from the requirements of the Contract Documents.
- .7 Allow ten days for Consultant's review of each submission.
- .8 Adjustments made on shop drawings by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work.
- .9 Make any changes in submitted drawings which Consultant may require, consistent with Contract Documents and resubmit unless otherwise directed by Consultant. When resubmitting, notify Consultant in writing of any revisions other than those requested by Consultant.
- .10 Accompany submissions with transmittal letter containing:
  - .1 Date.
  - .2 Project title and number.
  - .3 Contractor's name and address.
  - .4 Identification and quantity of each shop drawing, product data and sample.
  - .5 Other pertinent data.
- .11 Submissions shall include:
  - .1 Date and revision dates.
  - .2 Project title and number.
  - .3 Name and address of:
    - .1 Subcontractor.
    - .2 Supplier.
    - .3 Manufacturer.
  - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
  - .5 Details of appropriate portions of Work as applicable:
    - .1 Fabrication.
    - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
    - .3 Setting or erection details.
    - .4 Capacities.
    - .5 Performance characteristics.

- .6 Standards.
  - .7 Operating weight.
  - .8 Wiring diagrams.
  - .9 Single line and schematic diagrams.
  - .10 Relationship to adjacent work.
  - .12 After Consultant's review, distribute copies.
  - .13 Submit one electronic copy in PDF format of shop drawings for each requirement requested in specification Sections and as Consultant may reasonably request.
  - .14 Submit electronic copy in PDF format of product data sheets or brochures for requirements requested in Specification Sections and as requested by Consultant where shop drawings will not be prepared due to standardized manufacture of product.
  - .15 Delete information not applicable to project.
  - .16 Supplement standard information to provide details applicable to project.
  - .17 If upon review by Consultant, no errors or omissions are discovered or if only minor corrections are made, copies will be returned, and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
  - .18 The review of shop drawings by the Consultant is for sole purpose of ascertaining conformance with general concept.
    - .1 This review shall not mean that the Consultant approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
    - .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.
- 1.5 Interference Drawings
- .1 Prepare interference drawings to coordinate the installation of the work of all sections, within available space. Conflicts between trades which could be determined beforehand, by the careful coordination and preparation of interference drawings, shall be corrected at no expense to the Owner.
  - .2 Prepare interference drawings of all buried services as necessary to avoid conflicts with new or existing structures, foundations or services.
  - .3 Submit interference and equipment placing drawings as specified in Section 01 71 00, when requested by the Consultant.
- 1.6 Progress Photographs
- .1 Progress photograph to be electronically formatted and labelled as to location and view.

1.7 Samples

- .1 Submit for review samples as requested in respective specification Sections. Label samples with origin, manufacturer, product information, applicable specification section, and intended use.
- .2 Notify Consultant in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .3 Where colour, pattern or texture is criterion, submit full range of manufacturer's samples.
- .4 Adjustments made on samples by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work.
- .5 Make changes in samples which Consultant may require, consistent with Contract Documents.
- .6 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.8 Mock-Ups

- .1 Erect mock-ups in accordance with 01 45 00 - Quality Control.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Not Used

- .1 Not used

End of Section

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## PART 1 GENERAL

### 1.1 Section Includes

- .1 Administrative
- .2 Fires
- .3 Disposal of Wastes

### 1.2 References

- .1 Statutes of Canada 1999 Chapter 33.
  - .1 Canadian Environmental Protection Act 1999.
  - .2 SOR/2003-289. Federal Halocarbon Regulations, 2003.
  - .3 Transportation of Dangerous Goods Act, 1992 (1992, c. 34)

### 1.3 Administrative

- .1 Comply with all federal, provincial, and municipal regulatory requirements and guidelines for environmental protection and natural resource conservation, including those referenced above.
- .2 Failure to comply with environmental requirements may result in a stop work order or assessment of damages commensurate with repair of damage.
- .3 It is the Contractor's responsibility to be aware of environmental requirements and the best management practices and pollution control measures necessary to meet them.
- .4 It is the Contractor's responsibility to obtain and abide by permits, licenses and compliance certificates at appropriate times and frequencies as required by the authorities having jurisdiction.
- .5 All hazardous materials are to be stored with secondary containment

### 1.4 Fires

- .1 Fires and burning of rubbish on site not permitted.

### 1.5 Disposal of Wastes

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

## PART 2 PRODUCTS

### 2.1 Not Used

- .1 Not used

## PART 3 EXECUTION

### 3.1 Not Used

- .1 Not used

End of Section

## PART 1 GENERAL

### 1.1 Section Includes

- .1 References
- .2 Owner's Regulations
- .3 Standards and Definitions
- .4 Designated Substances
- .5 Hazardous Materials
- .6 Spills Reporting
- .7 Potable Water Systems
- .8 Access for Inspection and Testing
- .9 Other Regulatory Requirements

### 1.2 References

- .1 Perform Work in accordance with Ontario Building Code (OBC), National Fire Code of Canada (NFC), the Canadian Electrical Code CSA C22.1:21 including all Supplements and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.
- .2 Where a material is designated in the Contract Documents for a certain application, unless otherwise specified, that material shall conform to standards designated in the Code. Similarly, unless otherwise specified, installation methods and standards of workmanship shall also conform to standards invoked by the aforementioned Code.
- .3 Meet or exceed requirements of:
  - .1 Contract documents.
  - .2 Specified standards, codes and referenced documents.
  - .3 Manufacturer's instructions.
- .4 Where requirements of Contract Documents exceed Code requirements provide such additional requirements.
- .5 Where the Building Code or the Contract Documents do not provide all information necessary for complete installation of an item, then the manufacturer's instructions for first quality workmanship shall be strictly complied with.

### 1.3 Owner's Regulations

- .1 Conform to requirements, regulations and procedures of the Owner.

### 1.4 Standards and Definitions

- .1 Where a reference is made to specification standards produced by various organizations and agencies, conform to latest edition of standards, as amended and revised to date of Contract.
- .2 Have a copy of each specified standard which relates to your work available on the site to be produced immediately on Consultant's request.

### 1.5 Designated Substances

- .1 Known designated substances are identified in the Designated Substance Report provided by the Owner.

- .2 Stop work immediately when material resembling asbestos, mould or any other designated substance which is not identified in the Designated Substance Report is encountered during the course of the work. Notify Owner and Consultant immediately.
- .3 The Owner will arrange for independent testing of suspected designated substances and removal of such substances encountered on the site during the course of the work which are not identified in the Designated Substance Report.

#### 1.6 Hazardous Materials

- .1 Definition: "Hazardous Material" is material, in any form, which by its nature, may be flammable, explosive, irritating, corrosive, poisonous, or may react violently with other materials, if used, handled or stored improperly. Included are substances prohibited, restricted, designated or otherwise controlled by law.
- .2 Provide SDS for all materials brought to the Place of Work.
- .3 Hazardous Materials will not be introduced for experimental or any other use prior to being evaluated for hazards.
- .4 Make known to the Consultant those hazardous materials or designated substances intended to be used in the workplace and receive permission to use before introducing to the Owner's property.
- .5 Many common construction materials such as asbestos pipe and various insulations are designated substances and shall not be used under any circumstances.

#### 1.7 Spills Reporting

- .1 Spills or discharges of pollutants or contaminants under the control of the Contractor, and spills or discharges of pollutants or contaminants that are a result of the Contractor's operations that cause or are likely to cause adverse effects shall forthwith be reported to the Consultant. Such spills or discharges and their adverse effects shall be as defined in the Environmental Protection Act R.S.O. 1999.
- .2 All spills or discharges of liquid, other than accumulated rain water, from luminaries, internally illuminated signs, lamps, and liquid type transformers under the control of the Contractor, and all spills or discharges from this equipment that are a result of the Contractor's operations shall, unless otherwise indicated in the Contract, be assumed to contain PCB's and shall forthwith be reported to the Consultant.
- .3 This reporting will not relieve the Contractor of his legislated responsibilities regarding such spills or discharges.

#### 1.8 Potable Water Systems

- .1 Potable water systems in completed buildings must meet criteria and guidelines established by Provincial and Municipal authorities, prior to occupancy by the Owner.
- .2 Upon completion, submit testing certificates verifying water quality and water systems meets all applicable Provincial and Legislated Standards

1.9 Access for Inspection and Testing

- .1 Cooperate fully with and provide assistance to, all outside authorities including Building Inspectors, utilities, testing agencies and consultants, with the inspection of the Work.

1.10 Other Regulatory Requirements

- .1 Conform to the requirements of the Ontario Ministry of Transportation and Local authorities regarding transportation of materials.
- .2 Conform to the requirements of the Ontario Ministry of the Environment.
- .3 Conform to the requirements of the Ontario Ministry of Labour.
- .4 Conform to all applicable local by-laws, regulations and ordinances.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Not Used

- .1 Not used

End of Section

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## PART 1 GENERAL

### 1.1 Section Includes

- .1 Inspection
- .2 Independent Inspection Agencies.
- .3 Access to Work
- .4 Procedures
- .5 Rejected Work
- .6 Reports
- .7 Contractors Responsibilities
- .8 Tests and Mix Designs
- .9 Mock-Ups
- .10 Equipment and Systems.

### 1.2 Inspection

- .1 Contractor is responsible for Quality Control (QC).
- .2 Allow Owner and Consultant access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .3 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Consultant instructions, or law of Place of Work.
- .4 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .5 Consultant will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Owner shall pay cost of examination and replacement.

### 1.3 Independent Inspection Agencies

- .1 Independent Inspection and Testing Agencies will be engaged by Contractor for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by the Contractor and paid from the cash allowances specified in Section 01 21 13. Refer to Section 01 29 83 - Payment Procedures for Testing Laboratory Services.
- .2 Provide equipment required for executing inspection and testing by appointed agencies.
- .3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Consultant at no cost to Owner. Pay costs for retesting and re-inspection.

### 1.4 Access to Work

- .1 Allow inspection and testing agencies access to Work, off site manufacturing and fabrication plants.

- .2 Co-operate to provide reasonable facilities for such access.

#### 1.5 Procedures

- .1 Notify Owner and Consultant 48 hours in advance of 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 orderly sequence to not cause delays in Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples

#### 1.6 Rejected Work

- .1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Consultant as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- .2 Make good other work damaged by such removals or replacements promptly.
- .3 If in opinion of Consultant it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Consultant will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Consultant.

#### 1.7 Reports

- .1 Submit electronic .pdf format inspection and test reports to Consultant.
- .2 Provide copies to Subcontractor of work being inspected or tested or manufacturer or fabricator of material being inspected or tested.

#### 1.8 Contractors Responsibilities

- .1 Be responsible for the execution of the Construction Quality Plan and is to pay all costs for the execution of the Construction Quality Plan. Designate an experienced site representative for carrying out the Construction Quality Plan.
- .2 Provide the Owner with a completed quality product for the Work. Contractor shall be responsible for any costs associated with re-testing and reperforming the Work as a result of the Contractor's poor performance or workmanship or other failure to comply with the Contract Documents.
- .3 All Work shall be done by persons qualified in their respective trades, and the workmanship shall be first-class in every respect. Contractor is responsible for ensuring employees are appropriately trained. All materials and equipment furnished shall be the best of their respective kinds for the intended use and unless otherwise specified, same shall be new and of the latest design.
- .4 The Consultant will have the authority to reject Work that does not conform to the Contract Documents or may require special inspection or testing, whether or not such Work is to be then fabricated, installed or completed.
- .5 Failure by a Contractor to conduct its operations, means and methods and coordinate proper

sequencing of the Work may cause the Owner to withhold payment or any other means deemed necessary to correct non-conforming Work.

- .6 The Owner shall engage a testing firm to perform such engineering laboratory services and on-site inspection as deemed necessary by the Owner. The testing firm will determine compliance with the requirements of the Contract Documents. This Work will not be a service to the Contractors for the performing of tests and checking of materials required of the Contractors.
- .7 Copies of test and inspection reports will be furnished to the Contractor. The laboratory and its representatives will be instructed to promptly call to the attention of the Contractor, any instance of non-compliance with the requirements of the Contract Documents. Failure to so notify the Contractor shall not relieve the Contractor of any of its responsibilities for compliance or making good workmanship or materials which are not in compliance with the requirements of the Contract Documents. The agency shall notify the Consultant and the Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services
- .8 Contractor's construction materials, procedures and work shall be subject to specified testing procedures and shall be in conformance with the Contract Documents as verified by Testing Agency.
- .9 Cooperate with the testing firm and provide labor to assist with sample preparations where applicable.
- .10 Except where specifically indicated to be provided by another entity as identified, inspections, tests, and similar quality control services including those specified to be performed by independent agency are the Contractor's responsibility, and costs thereof are not to be included in contract sum.
- .11 Cooperate with independent agencies performing required inspections, tests, and similar services. Provide auxiliary services as reasonably requested, including access to Work, the taking of samples or assistance with the taking of samples, delivery of samples to test laboratories, and security and protection for samples and test equipment at Project site.
- .12 Coordination: Contractor and each engaged independent agency performing inspections, tests, and similar services for project are required to coordinate and sequence activities so as to accommodate required services with minimum delay of Work and without the need of removal/replacement of work to accommodate inspections and tests. Scheduling of times for inspections, tests, taking of samples, and similar activities is Contractor's responsibility.
- .13 Where sampling and testing is required for Sections of Work listed in the Contract Documents, the tests shall be performed by an independent testing lab and paid for by the Contractor.
- .14 Test procedures to be used shall be submitted for approval of the Consultant where other than those specified are recommended by the testing agency.
- .15 Testing Agency Duties: The independent Testing Agency engaged to perform inspections, sampling and testing of materials and construction specified in individual Specification Sections shall cooperate with the Owner, the Consultant and Contractors in performance of its duties, and shall provide qualified personnel to perform required inspections and tests.
- .16 Contractor is responsible for scheduling times for inspections, tests, taking samples and similar activities.

1.9 Tests and Mix Designs

- .1 Furnish test results and mix designs as requested.

1.10 Mockups

- .1 Prepare mockups for Work specifically requested in specifications.
- .2 Construct in locations acceptable to Consultant.
- .3 Prepare mockups for Consultant's review with reasonable promptness and in orderly sequence, to not cause delays in Work.
- .4 Failure to prepare mockups in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .5 Mock-ups may remain as part of Work unless indicated otherwise.

1.11 Equipment and Systems

- .1 Submit adjustment and balancing reports for mechanical, electrical and building equipment systems.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Not Used

- .1 Not used

End of Section

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PART 1 GENERAL

1.1 Section Includes

- .1 Temporary utilities

1.2 Installation and Removal

- .1 Provide temporary utilities and controls in order to execute work expeditiously.
- .2 Remove from site all such work after use.

1.3 Water Supply

- .1 Existing sources of water can be made available to the Contractor at no charge, subject to operational requirements. Arrange for connection and pay all costs for installation, maintenance and removal. Conversions or alterations to existing sources of water to meet construction requirements are the responsibility of the Contractor.
- .2 The points of delivery and limits on amount available will be determined on site by the Owner whose written permission must be obtained before any connection is made.

1.4 Temporary Heating and Ventilation

- .1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.
- .2 Construction heaters used inside building must be vented to outside or be flameless type. Solid fuel salamanders are not permitted, unless prior approval is given by the Consultant.
- .3 Provide temporary heat and ventilation in enclosed areas as required to:
  - .1 Facilitate progress of Work.
  - .2 Protect Work and products against dampness and cold.
  - .3 Prevent moisture condensation on surfaces.
  - .4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
  - .5 Provide adequate ventilation to meet health regulations for safe working environment.
- .4 Maintain temperatures of minimum 10° C in areas where construction is in progress.
- .5 Ventilating:
  - .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
  - .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
  - .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
  - .4 Ventilate storage spaces containing hazardous or volatile materials.
  - .5 Ventilate temporary sanitary facilities.
  - .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.
- .6 Permanent heating system of building may be used when available.. Be responsible for damage to heating system if use is permitted.

- .7 On completion of Work for which permanent heating system is used, replace filters.
- .8 Ensure Date of Substantial Performance and warranties for heating system do not commence until entire system is in as near original condition as possible and is certified by Consultant.
- .9 Pay costs for maintaining temporary heat, when using permanent heating system. Owner will pay utility charges when temporary heat source is existing building equipment.
- .10 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
  - .1 Conform to applicable codes and standards.
  - .2 Enforce safe practices.
  - .3 Prevent abuse of services.
  - .4 Prevent damage to finishes.
  - .5 Vent direct fired combustion units to outside.
- .11 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

**1.5**     Temporary Power and Light

- .1 Existing sources of electric power can be made available to the Contractor. Conversions or alterations to existing sources of electric power to meet construction requirements are the responsibility of the Contractor.
- .2 The points of delivery and limits on amount available will be determined on site by the Owner whose written permission must be obtained before any connection is made.
- .3 Electrical power and lighting systems installed under this Contract may be used for construction requirements only with prior approval of Consultant provided that guarantees are not affected.
- .4 Provide and maintain temporary lighting throughout project. Lighting levels shall be sufficient to complete work including inspections. Provide minimum lighting levels of 400 lux at work areas. Lighting levels at floors and stairs not within work areas shall be not less than 160 lux at all times during construction activity.
- .5 All equipment used shall be CSA approved.
- .6 Wiring and method of installation shall conform to local power requirements and shall be reviewed by a licensed inspector prior to use.

**1.6**     Temporary Communication Facilities

- .1 Provide and pay for temporary telephone, fax, cellular data, lines and all equipment necessary for Contractor's own use.

**PART 2**   PRODUCTS

**2.1**     Not Used

- .1 Not used

**PART 3**   EXECUTION

**3.1**     Not Used

**Project:** 23172  
**Description:** Ground Floor Service, Peterborough City Hall Renovation  
500 George St. North Peterborough ON.

**TEMPORARY UTILITIES**  
**Section 01 51 00**

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.1 Not used

End of Section

## **PART 1 GENERAL**

### **1.1 Section Includes**

- .1 Construction aids.
- .2 Site storage.
- .3 Construction parking
- .4 Offices
- .5 Equipment, tool and material storage.
- .6 Sanitary facilities.
- .7 Signage.
- .8 Shoring

### **1.2 References**

- .1 CSA Group (CSA)
  - .1 CAN/CSA Z321-96 (R2006) Signs and Symbols for the Workplace
  - .2 CAN/CSA Z797-18 Code of Practice for Access Scaffold

### **1.3 Installation and Removal**

- .1 Provide construction facilities in order to execute work expeditiously.
- .2 Remove from site all such work after use.

### **1.4 Site Storage/Loading**

- .1 Do not unreasonably encumber premises with products.
- .2 Do not load or permit to load any part of Work with a weight or force that will endanger the Work.

### **1.5 Construction Parking**

- .1 Parking will be permitted on site at areas designated by the Owner provided it does not disrupt performance of Work or ongoing Owners operations.

### **1.6 Offices**

- .1 General Contractor may provide their own offices as necessary and subject to site constraints.  
Direct location of these offices.

### **1.7 Equipment, Tool and Material Storage**

- .1 Provide and maintain, in a clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
- .2 Locate materials not required to be stored in weatherproof sheds on site in a manner to cause least interference with work activities.

### **1.8 Sanitary Facilities**

- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.

- .2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.

#### 1.9 Construction Signage

- .1 Direct requests for approval to erect a Contractor signboard to Consultant.
- .2 Signs and notices for safety and instruction shall be in English. Graphic symbols shall conform to CAN/CSA Z321.
- .3 Post "Construction Zone" signage outside barrier and entrance to all work areas.
- .4 Maintain approved signs and notices in good condition for duration of project and dispose of off-site on completion of project.
- .5 Install signage to direct site traffic and deliveries to the Construction work areas.

#### 1.10 Shoring

- .1 Examine the site to determine the conditions under which work will be performed.
- .2 Contractor shall formulate his own conclusions as to the extent of the existing conditions and shoring required.
- .3 The method of shoring shall be according to the Contractor's and his Engineer's directions.
- .4 All existing loads must be shored prior to commencement of demolition and removal of load bearing elements.
- .5 All shoring and frame braces must be supplied with a safe load rating which must not be exceeded. Install in accordance with manufacturer's recommended procedures and safety guidelines. Ensure that the safe load conditions of the shoring are not exceeded by dead, live or construction loads.
- .6 All shoring shall be subject to the Consultant's review and approval prior to commencing demolition work.
- .7 Completely remove all shoring after new structure is installed and all concrete is set.
- .8 Submit shoring drawings and a proposed installation procedure stamped by a professional engineer registered in the Province of Ontario. Procedures shall follow the information provided on these drawings. The shoring design engineer shall be retained and paid for by the Contractor. The shoring engineer shall review all existing conditions on site prior to completing shoring design.
- .9 Removal of existing materials without proper engineered shoring is a safety hazard and will not be permitted.
- .10 Make good all damage to the existing structure and adjoining structures and bear full responsibility for failure to provide adequate shoring.
- .11 The failure or refusal of the Consultant to suggest the use of shoring, shall not in any way or to any extent relieve the Contractor of any responsibility concerning the condition of the work or of any of their obligations under the Contract, nor impose any liability on the Owner or their agents; nor shall

any delay, whether caused by any action or want of action on the part of the Contractor, or by any act of the Owner, or their agents, or employees, relieve the Contractor from necessity of properly and adequately protecting the existing structure from collapse or damage, nor from and of his obligations under the Contract relating to injury to persons or property, nor entitle him to any claims for extra compensation or an extension in schedule.

## **PART 2 PRODUCTS**

### **2.1 Not Used**

.1 Not used

## **PART 3 EXECUTION**

### **3.1 Not Used**

.1 Not used

End of Section

## **PART 1 GENERAL**

### **1.1 Section Includes**

- .1 Barriers.
- .2 Environmental Controls.
- .3 Traffic Controls.
- .4 Fire Routes.

### **1.2 Installation and Removal**

- .1 Provide temporary controls in order to execute Work expeditiously.
- .2 Remove from site all such work after use.

### **1.3 Guard Rails and Barricades**

- .1 Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs and wherever else necessary to prevent accidental falls.
- .2 Provide as required by governing authorities.

### **1.4 Dust Tight Screens**

- .1 Provide dust tight screens or partitions to localize dust generating activities, and for protection of workers, finished areas of Work and public.
- .2 Maintain and relocate protection until such work is complete.

### **1.5 Protection of Building Finishes**

- .1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.
- .2 Provide necessary screens, covers, and hoardings.
- .3 Confirm with Consultant locations and installation schedule 3 days prior to installation.
- .4 Be responsible for damage incurred due to lack of or improper protection.

### **1.6 Protection of Surrounding Work**

- .1 Provide protection for finished and partially finished Work from damage.
- .2 Provide necessary cover and protection.
- .3 Be responsible for damage incurred due to lack of or improper or inappropriate protection.

### **1.7 Public Traffic Flow**

- .1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect the public.

1.8 Fire Routes

- .1 Maintain access to property including overhead clearances for use by emergency response vehicles.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Not Used

- .1 Not used

End of Section

## PART 1 GENERAL

### 1.1 Section Includes

- .1 Product quality, availability, storage, handling, protection, and transportation.
- .2 Manufacturer's instructions.
- .3 Quality of Work, coordination and fastenings.
- .4 Dielectric Separation
- .5 Tolerances for Execution of Work.
- .6 Protection of Work in progress.
- .7 Existing Utilities

### 1.2 Definition – Basis of Design

- .1 Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. Published attributes and characteristics of basis-of-design product establish salient characteristics of products.
  - .1 Evaluation of Comparable Products: In addition to the basis-of-design product description, product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification. Manufacturer's published attributes and characteristics of basis-of-design product also establish salient characteristics of products for purposes of evaluating comparable products.
- .2 Comparable Product Request Submittal: An action submittal requesting consideration of a comparable product, including the following information:
  - .1 Identification of basis-of-design product or fabrication or installation method to be replaced, including Specification Section number and title and Drawing numbers and titles.
- .3 Basis-of-Design Product Specification Submittal: An action submittal complying with requirements in Section 01 33 00 -Submittal Procedures.

### 1.3 Quality

- .1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality (compatible with specifications) for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
- .2 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility but is 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 quality or fitness of products, decision rests strictly with Consultant based upon requirements of Contract Documents.
- .4 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout 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.

**1.4**     Availability

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

**1.5**     Storage, Handling and Protection

- .1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.
- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Store cementitious products clear of earth or concrete floors, and away from walls.
- .5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
- .6 Store sheet materials and lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.
- .8 Remove and replace damaged products at own expense and to satisfaction of Consultant.
- .9 Touch up damaged factory finished surfaces to Consultant's satisfaction. Use touch up materials to match original. Do not paint over name plates.

**1.6**     Transportation

- .1 Pay costs of transportation of products required in performance of Work.
- .2 Transportation cost of products supplied by Owner will be paid for by Owner. Contractor shall be responsible for the unloading, handling and storage of such products.

**1.7**     Manufacturer's Instructions

- .1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's 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 specifications and manufacturer's instructions, so that Consultant may establish course of action.

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

#### 1.8 Quality of Work

- .1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed.
- .2 Immediately notify Consultant if required Work is such as to make it impractical to produce required results.
- .3 Do not employ anyone unskilled in their required duties. Consultant reserves right to require dismissal from site, workers deemed incompetent or careless.
- .4 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Consultant, whose decision is final.

#### 1.9 Coordination

- .1 Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.
- .2 Be responsible for coordination and placement of openings, sleeves and accessories.

#### 1.10 Concealment

- .1 In finished areas, conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.
- .2 Before installation, inform Consultant if there is interference. Install as directed by Consultant.

#### 1.11 Remedial Work

- .1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Coordinate adjacent affected Work as required.
- .2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

#### 1.12 Location of Fixtures

- .1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.
- .2 Inform Consultant of conflicting installation. Install as directed.

#### 1.13 Fastenings

- .1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.
- .2 Prevent electrolytic action between dissimilar metals and materials.

- .3 Use non corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.
- .4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.
- .5 Keep exposed fastenings to a minimum, space evenly and install neatly.
- .6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

1.14 Fastenings – Equipment

- .1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.
- .2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas.
- .3 Bolts may not project more than one diameter beyond nuts.
- .4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

1.15 Dielectric Separation

- .1 Ensure that a dielectric separator is provided in a permanent manner over entire contact surfaces to prevent electrolytic action (galvanic corrosion) between dissimilar materials. Similarly, prevent corrosion to aluminum in contact with alkaline materials such as contained in cementitious materials.

1.16 Tolerances for Execution of Work

- .1 Unless specifically indicated otherwise, Work shall be installed plumb, level, square and straight.
- .2 Unless acceptable tolerances are otherwise specified in specification sections, or are otherwise required for proper functioning of equipment, site services and mechanical and electrical systems:
  - .1 "Plumb and level" shall mean plumb or level within 1 mm in 1m.
  - .2 "Square" shall mean not in excess of 10 seconds lesser or greater than 90 degrees.
  - .3 "Straight" shall mean within 1 mm under a 1 m long straight edge.
  - .4 "Flush" shall mean within:
    - .1 6 mm for exterior concrete, masonry and paving materials.
    - .2 1 mm for interior concrete, masonry, tile and similar surfaces.
    - .3 0.5 mm for other interior surfaces.
- .3 Allowable tolerances shall not be cumulative

1.17 Protection of Work in Progress

- .1 Adequately protect Work completed or in progress. Work damaged or defaced due to failure in providing such protection is to be removed and replaced, or repaired, as directed by Consultant, at no increase in Contract Price or Contract Time.

- .2 Prevent overloading of any part of building. Do not cut, drill or sleeve any load bearing structural member, unless specifically indicated without written approval of the Consultant.

1.18 Existing Utilities

- .1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, and/or building occupants and pedestrian and vehicular traffic.
- .2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

1.19 Hazardous Materials

- .1 Report any found or suspected hazardous materials to the Owner.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Not Used

- .1 Not used

End of Section

## PART 1 GENERAL

### 1.1 Section Includes

- .1 Safety Requirements
- .2 Fire Protection
- .3 Accident Reporting
- .4 Records on Site

### 1.2 References

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.
- .2 Fire Commissioners of Canada, FC 301, Standard for Construction Operations.
- .3 National Fire Protection Agency (NFPA)
  - .1 NFPA 241 Standard for Safeguarding Construction, Alteration, and Demolition Operations
- .4 Occupational Health and Safety Act.
  - .1 R.R.O. 1990, Reg. 860: Workplace Hazardous Materials Information System (WHMIS)
  - .2 O. Reg. 632/05: Confined Spaces
- .5 Ontario Building Code.

### 1.3 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit to Owner and Consultant copies of the following documents, including updates issued:
  - .1 Notice of Project filed with Provincial Ministry of Labour or equivalent for Place of Work
  - .2 Site-specific Health and Safety Plan prior to commencement of work on the work site. Plan shall include but not be limited to the following:
    - .1 Name and contact info of Contractor's Health and Safety Representative for Work Site; including twenty-four (24) hour emergency contact phone numbers.
    - .2 Phone numbers of local fire, police, and ambulance outside of 911 services.
    - .3 Location of nearest medical facility and level of injury that each can service.
  - .3 Submit to the Owner, Consultant and Municipal Fire Department, for review, a "Fire Safety Plan" conforming to Section 2.14 of the National Fire Code of Canada. Maintain a copy of the "Fire Safety Plan" on site.
  - .4 Copies of certification for all employees on site of applicable safety training including, but not limited to:
    - .1 WHMIS.
    - .2 Fall arrest and protection.
    - .3 Suspended Access Equipment.
    - .4 Erection of Scaffolding.
    - .5 License for powder actuated devices.
  - .5 On-site Contingency and Emergency Response Plan addressing:
    - .1 Standard procedures to be implemented during emergency situations.
    - .2 Preventative planning and protocols to address possible emergency situations.
- .3 Guidelines for handling, storing, and disposing of hazardous materials that maybe encountered on site, including measures to prevent damage or injury in case of an accidental spill.
- .4 Incident and accident reports, promptly if and upon occurrence
  - .1 Reports or directions issued by authorities having jurisdiction, immediately upon issuance from that authority.
  - .2 Accident or Incident Reports, within 24 hours of occurrence.

- .5 Submit other data, information and documentation upon request by the Consultant as stipulated elsewhere in this section.

#### 1.4 Compliance Requirements

- .1 Comply with the latest edition of the Ontario Occupational Health and Safety Act, and the Regulations made pursuant to the Act.

#### 1.5 Constructor

- .1 Notify all regulatory bodies required for construction activities, (i.e., Notice of Project, employer notification, etc.). Notifications shall include, but not be limited to, the notification requirements laid out in OHSA Sec 51-53 and the requirements of Ontario Regulation 213/91 for Construction Projects, Sections 5, 6 and 7. For the purpose of this contract the Contractor shall be the "Constructor".
- .2 The "Constructor" will be solely responsible for the safety of all persons on the Site.

#### 1.6 Safety Requirements

- .1 Observe and enforce all construction safety measures and comply with the latest edition and amending regulations of the following documents and in the event of any differences among those provisions, the most stringent shall apply:
  - .1 Occupational Health and Safety Act and Regulations for Construction Projects, August 1997, Ontario Regulation 213/91 including amendments.
  - .2 Hazardous Products Act and Canada Labour Code.
  - .3 The Workplace Safety and Insurance Board, O. Reg 454.
  - .4 Ontario Building Code Act, Ontario Regulation 332/12 including amendments.
  - .5 National Building Code of Canada, Part 8: Safety Measures on Construction and Demolition Sites.
  - .6 National Fire Code of Canada.
  - .7 NFPA 241 Standard for Safeguarding Construction, Alteration, and Demolition Operations, 2013 Edition
  - .8 Environmental Protection Act.
  - .9 The Power Commission Act.
  - .10 The Boiler and Pressure Vessels Act.
  - .11 The Elevators and Lifts Act.
  - .12 The Operating Engineer's Act.
  - .13 Municipal statutes.
- .2 Obey all Federal, Provincial and Municipal Laws, Acts, Statutes, Regulations, Ordinances and By-laws which could in any way, pertain to the work outlined in the Contract, or to any employees of the Contractor. Satisfy all statutory requirements imposed by the Occupational Health and Safety Act and Regulations made thereunder, on a Contractor, and Constructor and/or Employer with respect to or arising out of the performance of the Contractors obligations under this Contract.
- .3 Working at Heights: The supervisor of the project, will be responsible to ensure that his employees and subcontractors/suppliers have current Working at Heights and Fall Protection certification.
- .4 The supervisor of the project will be responsible for his employees and subcontractors/suppliers maintaining standard safety practices, as well as the specific safety rules listed below, while working on the Owner's property.

- .5 The Owner reserves the right to order individuals to leave the site if the individual is in violation of any safety requirement or any Act. Any expense incurred will be the responsibility of the Contractor.
- .6 Notify the Owner should any hazardous condition become apparent.
- .7 Enforce the use of CSA approved hard hats, reflective vests and safety boots for all persons entering or working at the construction site. Refuse admission to those refusing to conform to this requirement.
- .8 Provide safeguard and protection against accident, injury or damage to any person on the site, adjacent work areas and adjacent property.

#### 1.7 Confined Space

- .1 Confined Space: Where applicable, provide the Consultant and all Regulatory Authorities with a copy of the Contractors' Confined Space Entry Procedure. In the event that defined procedures are not available, abide by the applicable requirements of the Occupational Health and Safety Act and all regulations made thereunder.
- .2 Persons intended to work in confined spaces, as defined by the Owner, must have formal training in performing work in confined spaces.
- .3 Provide proof of valid certificates of such training for all workers prior to entry of such workers into confined spaces.
- .4 Provide all necessary safety equipment for entry into confined spaces.
- .5 Where workers are required to enter a confined space, as defined by the OHSA, O. Reg. 632/05 Section 221.2, ensure that workers of the Contractor and all Subcontractors follow the requirements of the above legislation, including but not limited to:
  - .1 Having a method for recognizing each confined space to which the program applies
  - .2 Having a method for assessing the hazards to which workers may be exposed
  - .3 Having a method for the development of confined space entry plans (which include on-site rescue procedures)
  - .4 Having a method for training workers
  - .5 Having an entry-permit system.
  - .6 Supply the necessary tools and equipment to perform the confined space entry. These items include, but are not limited to, required documentation, gas detectors, breathing equipment, fall protection and rescue equipment.

#### 1.8 Safety Meetings

- .1 Site toolbox safety meetings will be held weekly for all Contractor employees and all sub trade contractors.
- .2 Where a Joint Health and Safety Committee is required on a project, workers and supervisors, selected, as members of the committee must attend.

#### 1.9 Workplace Hazardous Materials Information System (WHMIS)

- .1 Be familiar with WHMIS regulations and be responsible for compliance.
- .2 Provide to the Consultant a list of Designated Substances that will be brought to the site prior to

commencing work. Safety Data Sheets (SDS) and the hazardous material inventory for each substance listed must be kept on the Project.

- .3 Be responsible for all other requirements of regulations as applicable to Employers.
- .4 All controlled products to be properly labelled and stored.
- .5 Immediately inform Owner and Consultant if any unforeseen or peculiar safety-related factor, hazard, or condition becomes evident during performance of Work.

#### 1.10 Fire Protection

- .1 Provide and maintain safeguard and protection against fire in accordance with current fire codes and regulations.
- .2 Provide temporary fire protection throughout the course of construction. Particular attention shall be paid to the elimination of fire hazards.
- .3 Comply with the requirements of FCC No. 301 Standards for Construction Operations issued by the Fire Commissioner of Canada and the National Building Code.
- .4 Provide and maintain portable fire extinguishers during construction, in accordance with Part 6 of the National Fire Code of Canada 2015 and NFPA 241.
- .5 Maintain unobstructed access for firefighting at all areas in accordance with the National Building Code of Canada.

#### 1.11 First Aid

- .1 Provide such equipment and medical facility as required by WSI Act to supply first aid services to anyone who may be injured at the place of Work. Report all accidents or injuries to the proper authorities and to the Owner and Consultant.

#### 1.12 Accident Reporting

- .1 Investigate and report incidents and accidents as required by Occupational Safety and Health Act, and the Regulations made pursuant to the Act.

#### 1.13 Records on Site

- .1 Maintain on site a copy of the safety documentation as specified in this section and any other safety related reports and documents issued to or received from the authorities having jurisdiction.
- .2 Upon request, make copies available to the Consultant.

### PART 2 PRODUCTS

#### 2.1 Not Used

- .1 Not used

### PART 3 EXECUTION

**Project:** 23172  
**Description:** Ground Floor Service, Peterborough City Hall Renovation  
500 George St. North Peterborough ON.

**SAFETY REQUIREMENTS**  
Section 01 70 03

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3.1 Not Used

.1 Not used

End of Section

## PART 1 GENERAL

### 1.1 Section Includes

- .1 Field Engineering services.

### 1.2 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 On request of Consultant, submit documentation to verify accuracy of field engineering work.

### 1.3 Examination of Work and Site

- .1 Examine the existing building to be fully informed of their particulars as related to the Work.
- .2 Verify dimensions of completed Work in place before fabrication of Work to be incorporated with it. Ensure that all necessary job dimensions are taken for the proper execution of the work. Assume complete responsibility for the accuracy and completeness of such dimensions.
- .3 No claims for extra payment will be paid for extra work made necessary or for difficulties encountered due to conditions of the site which were visible or reasonably inferable from an examination of the site at the time prior to tender closing date and furthermore, failure of the Contractor to visit and examine the site shall be deemed a waiver of all claims for extra payment due to any condition of the site existing prior to tender closing date.
- .4 As-found damage: Record by photography and submit evidence to Consultant before commencing work, any found damaged surfaces or materials adjacent to new work, and not included under scope of this new work. Remedial work to any damage, not so recorded, shall be the responsibility of the Contractor.

### 1.4 Existing Services

- .1 Before commencing work, establish location and extent of service lines in area of Work and notify Consultant of findings. The Contractor is responsible for coordination of all utility locates.
- .2 Where Work involves breaking into or connecting to existing services, carry out work at times directed by authorities having jurisdiction, with minimum of disturbance to building occupants, pedestrian and vehicular traffic.
- .3 Where unknown services are encountered, immediately advise Consultant and confirm findings in writing.
- .4 Install temporary drain plugs to prevent construction debris from blocking pipes downstream of the work.
- .5 All existing concrete floor slabs shall be scanned prior to any cutting or breaking of concrete. Employ a qualified concrete scanning company or inspection and testing agency to scan and map floor slabs for reinforcing, plastic and metal conduit, piping, grounding cables, embedment and the like. Map all slabs and provide copies to the Owner and Consultant.

1.5 Location of Services, Equipment and Fixtures

- .1 Location of services, equipment, fixtures and outlets indicated on drawings or specified are to be considered as approximate.
- .2 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. Include existing equipment which affects or will be affected by the work.
- .3 Inform Consultant of impending installation and obtain approval for actual location.
- .4 Location of site services where required, is approximate and is based on information provided by the Owner. Undertake all locates to determine exact locations of existing services and lay out new services to avoid any conflicts with new building elements, including site improvements, building foundations and other new or existing services.
- .5 Submit field drawings and interference drawings to indicate relative position of various services and equipment. Refer to requirements for interference drawings specified elsewhere.
- .6 Prepare interference and equipment placing drawings to ensure that all components will be properly accommodated within the spaces provided.
- .7 Prepare drawings to indicate coordination and methods of installation of a system with other systems where their relationship is critical. Ensure that all details of equipment apparatus and connections are coordinated.
- .8 Ensure that clearances required by jurisdictional authorities and clearances for proper maintenance and access are indicated and maintained.
- .9 Submit interference drawings to Owner and Consultant in accordance with Section 01 33 00.
- .10 Unless specifically indicated by the Consultant, interference drawings will be received for information only and will not be reviewed.

1.6 Records

- .1 Maintain a complete, accurate log of control work as it progresses.
- .2 Record locations of maintained, re-routed and abandoned service lines.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Not Used

- .1 Not used

End of Section

## **PART 1 GENERAL**

### **1.1 Section Includes**

- .1 Requirements and limitations for cutting and patching the Work.

### **1.2 Submittals**

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit written request and obtain Consultant's approval in advance 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
- .3 Include in request:
  - .1 Identification of project.
  - .2 Location and description of affected Work.
  - .3 Statement on necessity for cutting or alteration.
  - .4 .Description of proposed Work, and products to be used.
  - .5 Alternatives to cutting and patching.
  - .6 Effect on Work of Owner or separate contractor.
  - .7 Date and time work will be executed.

### **1.3 Materials**

- .1 As specified and required for original installation.
- .2 Requests for change in materials shall include documentation indicating conformance to project requirements and intent.

### **1.4 Definitions**

- .1 Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- .2 Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

## **PART 2 PRODUCTS**

### **2.1 Materials**

- .1 General: Comply with requirements specified in other Sections.
- .2 In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
- .3 If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Consultant for the visual and functional performance of in-place materials.

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### PART 3 EXECUTION

#### 3.1 Preparation

- .1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
- .2 After uncovering, inspect conditions affecting performance of Work.
- .3 Beginning of cutting or patching means acceptance of existing conditions.
- .4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.
- .5 Provide protection from elements for areas which may be exposed by uncovering work; maintain excavations free of water.

#### 3.2 General

- .1 Carry out all cutting, fitting and patching required for the work of the Contract.
- .2 Repair all wall and floor surfaces where items have been removed.
- .3 Make good all finishes as required.
- .4 Repaint damaged wall surfaces.
- .5 Fit several parts together, to integrate with other Work.
- .6 Uncover Work to install ill-timed Work.
- .7 Remove and replace defective and non-conforming Work.
- .8 Provide cutting and patching of all openings in non-structural elements of Work as necessary to complete installation of mechanical and electrical Work. Include complete removal and replacement of such elements as necessary to provide construction access.
- .9 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
- .10 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.
- .11 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools are not allowed on masonry work without prior approval.
- .12 Restore work with new products in accordance with requirements of Contract Documents.
- .13 Fit work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- .14 At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with "ULC approved firestopping material, full thickness of the construction element. Include any openings in existing building elements created by removal of existing services or equipment.

- .15 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.

### 3.3 Cutting and Patching

- .1 General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
- .2 Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- .3 Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- .4 Temporary Support: Provide temporary support of work to be cut.
- .5 Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- .6 Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 01 10 00 - Summary of Work.
- .7 Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.
- .8 Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
  - .1 In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  - .2 Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  - .3 Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  - .4 Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
  - .5 Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
  - .6 Proceed with patching after construction operations requiring cutting are complete.
- .9 Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
  - .1 Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
  - .2 Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration

- into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
- .1 Clean piping, conduit, and similar features before applying paint or other finishing materials.
  - .2 Restore damaged pipe covering to its original condition.
  - .3 Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, colour, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform colour and appearance.
    - .1 Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
  - .4 Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
  - .5 Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- .10 Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

#### 3.4 Subfloor Levelling

- .1 Where existing flooring is to be removed from floor slabs to remain, including ceramic tile flooring, carefully remove all flooring, grout, adhesives, waterproofing membranes and the like down to the base slab. Clean, patch and repair slab where damaged with concrete or acceptable leveling compound in accordance with new flooring manufacturer's instructions and ASTM F710. Refer to original building drawings and remove and replace existing concrete floor toppings as necessary and where required.
- .2 Where new flooring is to be installed on new concrete slab or on framed floors, subfloor shall be levelled in accordance with flooring manufacturer's specifications and tolerances and with ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.

#### 3.5 Fire Barrier Seals

- .1 Ensure fire separations are maintained as indicated on the drawings. patch and firestop all penetrations accordingly.

End of Section

## **PART 1 GENERAL**

### **1.1 Section Includes**

- .1 Progressive Cleaning
- .2 Final Cleaning

### **1.2 References**

- .1 National Fire Protection Association (NFPA)
  - .1 NFPA 241-22 Standard for Safeguarding Construction, Alteration, and Demolition Operations.

### **1.3 Project Cleanliness**

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris.
- .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by the Owner. Do not burn waste materials on site.
- .3 Clear snow and ice from access to building, bank/pile snow in designated areas only.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Provide on-site containers for collection of waste materials and debris.
- .6 Provide and use clearly marked separate bins for recycling.
- .7 Clean interior areas prior to start of finishing work and maintain areas free of dust and other contaminants during finishing operations.
- .8 Store volatile waste in covered metal containers and remove from premises at end of each working day.
- .9 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .10 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

## **PART 2 PRODUCTS**

### **2.1 Products**

- .1 All cleaning materials and products shall be low VOC type. Submit list of cleaning products including SDS for approval prior to commencement of cleaning operations.
- .2 Use only cleaning materials recommended by manufacturer of surface to be cleaned and recommended by cleaning material manufacturer.

### PART 3 EXECUTION

#### 3.1 Final Cleaning

- .1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove waste products and debris other than that caused by others and leave Work clean and suitable for occupancy.
- .3 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .4 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.
- .5 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, floors and ceilings.
- .6 Clean lighting reflectors, lenses, and other lighting surfaces. Clean and/or replace lamps, light fixtures, grilles and lenses.
- .7 HEPA vacuum clean and dust building interiors, behind grilles, louvres and screens.
- .8 Thoroughly vacuum clean interior of electrical equipment.
- .9 Wax, seal, shampoo or prepare floor finishes, as recommended by manufacturer.
- .10 Clean and seal concrete floor surfaces with non-skid matte sealer.
- .11 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .12 Clean equipment and fixtures to a sanitary condition; clean or replace filters of mechanical equipment.
- .13 Remove debris and surplus materials from accessible concealed spaces.
- .14 Under direction of Consultant, aim adjustable luminaires.

#### 3.2 Waste Management and Disposal

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal.

End of Section

## PART 1 GENERAL

### 1.1 Section Includes

- .1 References.
- .2 Submittals.
- .3 Definitions.
- .4 Waste Management Goals for the Project.
- .5 Documents.
- .6 Waste Management Plan.
- .7 Materials Source Separation Program.
- .8 Disposal of Wastes.
- .9 Scheduling.
- .10 Storage, Handling and Protection.
- .11 Application.
- .12 Diversion of Materials.

### 1.2 References

- .1 O. Reg. 102/94 Waste Audits and Waste Reduction Work Plans.
- .2 O. Reg. 278/05 Occupational Health and Safety Act

### 1.3 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit a completed Waste Management Plan (WMP) prior to project start-up.

### 1.4 Definitions

- .1 Waste Management Plan (WMP): Contractor's approved overall strategy for waste management including waste reduction workplan and materials source separation program.
- .2 Materials Source Separation Program (MSSP): Consists of a series of ongoing activities to separate reusable and recyclable waste material into material categories from other types of waste at point of generation.
- .3 Separate Condition: Refers to waste sorted into individual types.

### 1.5 Waste Management Goals for the Project

- .1 The Owner has established that this Project shall generate the least amount of waste possible and that processes shall be employed that ensure the generation of as little waste as possible including prevention of damage due to mishandling, improper storage, contamination, inadequate protection or other factors as well as minimizing over packaging and poor quantity estimating.
- .2 Of the waste that is generated, the waste materials designated in this specification shall be salvaged for reuse and or recycling. Waste disposal in landfills or incinerators shall be minimized.

### 1.6 Waste Management Plan

- .1 Waste Management Plan: Submit a Waste Management Plan within 10 calendar days after receipt of Notice of Award of Contract, or prior to any waste removal, whichever occurs sooner. The Plan shall contain the following:
  - .1 Analysis of the proposed job site waste to be generated, including the types of recyclable and waste materials generated (by volume or weight). In the case of demolition, a list of each item proposed to be salvaged during the course of the project should also be prepared
  - .2 Alternatives to Land Filling: Contractor shall designate responsibility for preparing a list of each material proposed to be salvaged, reused, or recycled during the course of the Project.
- .2 Post WMP or summary where workers at site are able to review its content.

**1.7 Materials Source Separation Program**

- .1 The Waste Management Plan shall include a Source Separation Program for recyclable waste and shall be in accordance with the established policies currently in place at the local Municipality, and the requirements of O. Reg. 102/94.
- .2 Prepare MSSP and have ready for use prior to project start-up.
- .3 Implement MSSP for waste generated on project in compliance with approved methods and as approved by Consultant.
- .4 Provide on-site facilities for collection, handling, and storage of anticipated quantities of reusable and/or recyclable materials.
- .5 Provide containers to deposit reusable and/or recyclable materials.
- .6 Locate containers to facilitate deposit of materials without hindering daily operations.
- .7 Locate separated materials in areas which minimize material damage.
- .8 Collect, handle, store on-site, and transport off-site, salvaged materials in separate condition.

**1.8 Disposal of Wastes**

- .1 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .2 Provide appropriate on-site containers for collection of waste materials and debris. Containers for volatile wastes shall be closed containers and shall be removed from site daily.
- .3 Provide and use clearly marked separate bins for recycling.
- .4 Remove waste materials from site at regularly scheduled times or dispose of as directed by Consultant. Do not burn waste materials on site.
- .5 Remove waste material and debris from site and deposit in waste container at end of each working day.
- .6 Do not permit waste to accumulate onsite.
- .7 Burying of rubbish and waste materials is prohibited.

- .8 Disposal of waste into waterways, storm, or sanitary sewers is prohibited.

1.9 Scheduling

- .1 Coordinate work with other activities at site to ensure timely and orderly progress of the Work.

1.10 Storage, Handling and Protection

- .1 Store, materials to be reused, recycled and salvaged in locations as directed by Owner.
- .2 Materials from building demolition to be salvaged or re-used are to be removed and salvaged.
- .3 Unless specified otherwise, materials for removal become Contractor's property.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Application

- .1 Do work in compliance with Waste Management Plan.
- .2 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.
- .3 Source separate materials to be reused/recycled into specified sort areas.

3.2 Designated Substances

- .1 All designated substances abatement, removal and disposal shall be completed in accordance with O. Reg 278/05 and all other applicable legislation.

3.3 Diversion of Materials

- .1 Separate materials from general waste stream and stockpile in separate piles or containers, to approval of Owner, and consistent with applicable fire regulations. Mark containers or stockpile areas.
- .2 On-site sale of materials is not permitted.

End of Section

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## PART 1 GENERAL

### 1.1 Section Includes

- .1 Administrative procedures preceding preliminary and final inspections of Work.

### 1.2 References

- .1 Canadian Construction Documents Committee
  - .1 CCDC 2-2020 Stipulated Price Contract including Supplementary Conditions.
- .2 OAA/OGCA Document 100 - Recommended Procedures Regarding Substantial Performance of Construction Contracts and Completion Takeover of Projects.
- .3 The Construction Act.

### 1.3 Inspection and Declaration

- .1 Contractor's Inspection: The Contractor shall conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents. Submit duplicate copies of the deficiency list to the Owner and Consultant.
  - .1 Notify Consultant in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.
  - .2 Request Consultant's review.
- .2 Consultant's Review: Consultant and Contractor will perform review of Work to identify obvious defects or deficiencies. Contractor shall correct Work accordingly.
- .3 Completion: submit written certificate that following have been performed:
  - .1 Work has been completed and inspected for compliance with Contract Documents.
  - .2 Defects have been corrected and deficiencies have been completed.
  - .3 Equipment and systems have been tested, adjusted and balanced and are fully operational.
  - .4 Certificates required by Boiler Inspection Branch, Fire Commissioner, Utility companies, TSSA, ESA and other regulatory agencies have been submitted.
  - .5 Operation of systems have been demonstrated to Owner's personnel.
  - .6 Work is complete and ready for Final Review by the Consultant.
- .4 Final Inspection: when items noted above are completed, request final review of Work by Consultant, and Contractor. If Work is deemed incomplete by the Consultant, complete outstanding items and request re-review.
- .5 Declaration of Substantial Performance: when Consultant consider deficiencies and defects have been corrected and it appears requirements of Contract have been substantially performed, make application for certificate of Substantial Performance. Refer to CCDC 2, General Conditions Article GC 5.4 - Substantial Performance of Work and Payment of Holdback for specifics to application.
- .6 Commencement of Lien and Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance shall be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.
- .7 Final Payment: When Consultant considers final deficiencies and defects have been corrected and it appears requirements of Contract have been totally performed, make application for final payment. Refer to CCDC 2, General Conditions Article GC 5.5 – Final Payment for specifics to application.

- .8 Payment of Holdback: After issuance of certificate of Substantial Performance of Work, submit an application for payment of holdback amount in accordance with CCDC 2, General Conditions Article 5.4 - Substantial Performance of Work and Payment of Holdback.

## PART 2 PRODUCTS

### 2.1 Not Used

- .1 Not used

## PART 3 EXECUTION

### 3.1 Not Used

- .1 Not used

End of Section

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PART 1 GENERAL

1.1 Section Includes

- .1 As built, samples, and specifications.
- .2 Equipment and systems.
- .3 Product data, materials and finishes, and related information.
- .4 Operation and maintenance data.
- .5 Spare parts, special tools and maintenance materials.
- .6 Warranties and bonds.

1.2 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.

1.3 Submission

- .1 Prepare instructions and data using personnel experienced in maintenance and operation of described products.
- .2 At least 2 weeks prior to commencement of scheduled commissioning activities, submit 2 copies of the draft Operating and Maintenance Manuals, for Consultants review and use during the commissioning activities. After the completion of the commissioning activities, the Consultant will return to the Contractor 1 draft copy, with review comments, for revision. Submit 1 copy of the revised Operating and Maintenance for approval prior to the production of final copies. Prior to the Issuance of the Final Certificate of Completion, and within 10 working days after Substantial Performance, submit 2 copies of the final Operating and Maintenance Manuals.
- .3 Building will not be deemed ready for use unless the draft copies of the Operating and Maintenance Manuals and the "As-built" Record Documents have been submitted and reviewed by the Consultant.
- .4 Building will not be deemed ready for use unless the completed and submitted Operating and Maintenance Manuals and "As-built" Record Documents have been accepted by the Consultant.
- .5 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work.
- .6 If requested, furnish evidence as to type, source and quality of products provided.
- .7 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.

1.4 Format

- .1 The Operation and Maintenance, or "O & M" Manual, shall be submitted electronically on as USB flash drive stick, by the successful Bidder at the end of the Project. The O & M Manual shall be created in PDF and allow the use to click on an index item and be taken to that section of the O & M Manual. A minimum value of \$2,500 shall be included on the schedule of values for the O & M manual.
- .2 Organize data in the form as instructional manual.
- .3 Arrange content by Section numbers and sequence of Table of Contents.

1.5 Contents

- .1 Table of Contents: provide title of project;

- .1 Date of submission; names.
- .2 Addresses, and telephone numbers of Consultant and Contractor with name of responsible parties.
- .3 Schedule of products and systems, indexed to content of volume.
- .2 .For each product or system:
  - .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
  - .3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.
  - .4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
  - .5 Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.
- 1.6 As-Builts and Samples
  - .1 In addition to requirements in General Conditions, maintain at the site for Consultant one record copy of:
    - .1 Contract Drawings.
    - .2 Specifications.
    - .3 Addenda.
    - .4 Change Orders and other modifications to Contract.
    - .5 Reviewed shop drawings, product data, and samples.
    - .6 Field test records.
    - .7 Inspection certificates.
    - .8 Manufacturer's certificates.
  - .2 Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.
  - .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.
  - .4 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.
  - .5 Keep record documents and samples available for inspection by Consultant.
- 1.7 Recording Actual Site Conditions
  - .1 Record information on set of drawings, provided by Consultant.
  - .2 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.
  - .3 Contract Drawings and shop drawings: mark each item to record actual construction, including:
    - .1 Measured depths of elements of foundation in relation to finish first floor datum.
    - .2 Measured horizontal and vertical locations of underground utilities and appurtenances,

- 
- referenced to permanent surface improvements.
- .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
  - .4 Field changes of dimension and detail.
  - .5 Changes made by change orders.
  - .6 Details not on original Contract Drawings.
  - .7 References to related shop drawings and modifications.
- .4 Submit following drawings:
- .1 Record changes in red. Mark on one set of prints and at completion of project prior to final inspection, produce electronic "as-built" records on disk using latest version of AutoCad. Annotate "AS-BUILT RECORD" in each drawing title block.
  - .2 All changes shall be shown on a separate drawing layer named "as-built".
  - .3 At least 2 weeks prior to commencement of scheduled commissioning activities, submit one copy of the draft "As-built" Project Record Documents for Consultants review and use during the commissioning activities. After the completion of the commissioning activities, the Consultant will return to the Contractor the draft copy, with review comments, for revision. Prior to the Issuance of the Final Certificate of Completion, and within 10 working days after Substantial Performance, submit 2 copies of the final "As-built" Project Record Documents and disk of "as-built" record drawings.
  - .5 Specifications: legibly mark each item to record actual construction, including:
    - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
    - .2 Changes made by Addenda and change orders.
  - .6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections
- 1.8 Equipment and Systems
- .1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with Engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
  - .2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.
  - .3 Include installed colour coded wiring diagrams.
  - .4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
  - .5 Maintenance Requirements: include routine procedures and guide for troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
  - .6 Provide servicing and lubrication schedule, and list of lubricants required.
  - .7 Include manufacturer's printed operation and maintenance instructions.
  - .8 Include sequence of operation by controls manufacturer.

- .9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
  - .10 Provide installed control diagrams by controls manufacturer.
  - .11 Provide Contractor's co-ordination drawings, with installed colour coded piping diagrams.
  - .12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
  - .13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
  - .14 Include test and balancing reports as specified in Section 01 45 00 - Quality Control
  - .15 Additional requirements: as specified in individual specification sections.
- 1.9 Materials and Finishes
- .1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations.
  - .2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
  - .3 Moisture-Protection and Weather-Exposed Products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
  - .4 Additional Requirements: as specified in individual specifications sections.
- 1.10 Spare Parts
- .1 Provide spare parts, in quantities specified in individual specification sections.
  - .2 Provide items of same manufacture and quality as items in Work.
  - .3 Spare parts as identified in individual sections are to be delivered to the Owner prior to the Contractor's application for Substantial Performance.
  - .4 Receive and catalogue items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.
  - .5 Obtain receipt for delivered products and submit prior to final payment.
- 1.11 Maintenance Materials
- .1 Provide maintenance and extra materials, in quantities specified in individual specification sections.
  - .2 Provide items of same manufacture and quality as items in Work.
  - .3 Maintenance materials are to be delivered to the Owner prior to the Contractor's application for Substantial Performance.
  - .4 Receive and catalogue items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.
  - .5 Obtain receipt for delivered products and submit prior to final payment.
- 1.12 Special Tools
- .1 Provide special tools, in quantities specified in individual specification section.
  - .2 Provide items with tags identifying their associated function and equipment.
  - .3 Special tools are to be delivered to the Owner prior to the application for Substantial Performance.

- .4 Receive and catalogue items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.

1.13 Storage, Handling and Protection

- .1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.
- .2 Store in original and undamaged condition with manufacturer's seal and labels intact.
- .3 Store components subject to damage from weather in weatherproof enclosures.
- .4 Store paints and freezable materials in a heated and ventilated room.
- .5 Remove and replace damaged products at own expense and to satisfaction of Consultant.

1.14 Warranties and Guarantees

- .1 Separate each warranty or guarantee with index tab sheets keyed to Table of Contents listing.
- .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
- .3 Obtain warranties and guarantees, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work.
- .4 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial Performance is determined.
- .5 Verify that documents are in proper form, contain full information, and are notarized.
- .6 Co-execute submittals when required.
- .7 Retain warranties and guarantees until time specified for submittal.

PART 2 PRODUCTS

2.1 Not Used

- .1 Not used

PART 3 EXECUTION

3.1 Not Used

- .1 Not used

End of Section

## PART 1 GENERAL

### 1.1 General

- .1 Conform to the requirements of Division 1.

### 1.2 References

- .1 The National Building Code of Canada 2020, Part 8-Safety Measures on Construction and Demolition Sites.
- .2 CSA Group (CSA)
  - .1 CSA S350-M1980 (R2003) Code of Practice for Safety in Demolition of Structures
- .3 ASTM International (ASTM)
  - .1 ASTM F710-22 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
- .4 Ontario Provincial Regulations
  - .1 Ontario Regulation 102/94 Waste Audits and Waste Reduction Work Plans.
  - .2 Ontario Regulation 103/94 Environmental Protection Act.
  - .3 Ontario Regulation 213/07 The Fire Code.
  - .4 Ontario Regulation 232/98 Landfilling Sites.
  - .5 Ontario Regulation 278/05 Designated Substance - Asbestos on Construction Projects and in Buildings and Repair Operations.
  - .6 Ontario Regulation 347 Environmental Protection Act, General — Waste Management.
  - .7 Ontario Regulation 332/12 The Building Code.
- .5 The Workplace Health and Safety Act, and Regulations for Construction Projects.
- .6 The Contractors Health and Safety Policy.
- .7 Laws, rules and regulations of other authorities having jurisdiction.

### 1.3 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit detailed written schedule, methodology and proposed procedures for demolition, including a Safe Work Plan for review prior to commencement of demolition.
- .3 Where required by authorities having jurisdiction, submit for approval drawings, diagrams or details clearly showing sequence of disassembly work or supporting structures and underpinning.
- .4 Drawings for structural elements of the demolition process including shoring, underpinning and installation of new lintels or beams in existing load bearing walls, shall bear signature and stamp of qualified professional engineer registered in the Province of Ontario.
- .5 Submit proposed dust-control measures.
- .6 Submit proposed noise-control measures.
- .7 Submit schedule of demolition activities indicating the following:
  - .1 Detailed sequence of demolition and removal work, including start and end dates for each activity.
  - .2 Dates for shutoff, capping, and continuation of utility services.
- .8 If hazardous materials are encountered and disposed of, landfill records indicating receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

- .9 At Project Closeout: Submit record drawings in accordance with Section 01 78 00. Identify and accurately locate capped utilities and other subsurface structural, electrical, or mechanical conditions

#### 1.4 Permits

- .1 Obtain and pay for all permits and comply with all laws, rules, ordinances, and regulations relating to Demolition of Building and preservation of Public Health and Safety.
- .2 The Consultant will complete General Review during demolition in accordance with the Ontario Building Code. All other engineering required for shoring design and for other structural elements of the demolition work will be completed by the Contractor's own engineer and paid for by the Contractor.

#### 1.5 Waste Management Plan

- .1 All work of this section shall be completed in accordance with the contractors approved Waste Management Plan specified in Section 01 74 19.

#### 1.6 Definitions

- .1 Chemical Waste: Includes petroleum products, bituminous materials, salts, acids, alkalis, herbicides, pesticides, organic chemicals and inorganic wastes.
- .2 Demolition Waste: Building materials and solid waste resulting from construction, remodeling, repair, cleanup, or demolition operations that are not hazardous. This term includes, but is not limited to, asphalt concrete, Portland cement concrete, brick, lumber, gypsum wallboard, cardboard and other associated packaging, roofing material, ceramic tile, carpeting, plastic pipe, and steel. The materials may include rock, soil, tree stumps, and other vegetative matter resulting from land clearing and landscaping for construction or land development projects.
- .3 Environmental Pollution and Damage: The presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human or animal life; affect other species of importance to humanity; or degrade the utility of the environment for aesthetic, cultural or historical purposes.
- .4 Inert Fill: A permitted facility that accepts inert waste such as asphalt and concrete exclusively for the purpose of disposal.
- .5 Inert Solids/Inert Waste: Non-liquid solid waste including, but not limited to, soil and concrete that does not contain hazardous substances or soluble pollutants at concentrations in excess of water-quality standards established by a regional water board and does not contain significant quantities of decomposable solid waste.
- .6 Landfill: A landfill that accepts non-hazardous materials such as household, commercial, and industrial waste, resulting from construction, remodeling, repair, and demolition operations. A landfill must have a solid waste facilities permit from the Ministry of the Environment and be in conformance to O. Reg 232/98.
- .7 Recycling: The process of sorting, cleansing, treating and reconstituting materials for the purpose of using the altered form in the manufacture of a new product. Recycling does not include burning, incinerating or thermally destroying solid waste.

- .8 Remove: Remove and legally dispose of items, except those identified for use in recycling, re-use, and salvage programs.
- .9 Reuse: The use, in the same or similar form as it was produced, of a material which might otherwise be discarded.
- .10 Solid Waste: All putrescible and non-putrescible solid, semisolid, and liquid wastes, including garbage, trash, refuse, paper, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, dewatered, treated, or chemically fixed sewage sludge which is not hazardous waste, manure, vegetable or animal solid and semisolid wastes, and other discarded solid and semisolid wastes. "Solid waste" does not include hazardous waste, radioactive waste, or medical waste as defined or regulated by law.

#### 1.7 Quality Assurance

- .1 Demolition Firm Qualifications: Demolition contractor shall be an experienced firm that has successfully completed demolition Work similar to that indicated for this Project.
- .2 Regulatory Requirements: Comply with governing regulations before starting demolition. Comply with hauling and disposal regulations of authorities having jurisdiction. Obtain and pay for all permits required.
- .3 Pre-demolition Conference: Conduct a conference at Project site.
  - .1 Review the environmental goals of this Project and make a proactive effort to increase awareness of these goals among all labor forces on site.
  - .2 Review schedule and scheduling procedures.
  - .3 Review health and safety procedures.
  - .4 Review of Project conditions including review of record photographs.

#### 1.8 Project Conditions

- .1 Construct safety barriers, barricades, fencing and hoarding to separate public from work areas as described in Section 01 56 00.
- .2 The Owner assumes no responsibility for the actual condition of the structures to be demolished.
- .3 Conditions existing at the time of inspection for bidding purposes will be maintained by the Owner insofar as practicable. Variations within the structures may occur by the Owner's salvage operations prior to start of demolition.

### PART 2 PRODUCTS

#### 2.1 Materials

- .1 Provide all materials necessary for temporary shoring. On completion, remove temporary materials from site.
- .2 All building materials removed from the building shall become the property of the Contractor unless specified otherwise and shall be reused in new construction or removed from the Site.
- .3 All concrete, masonry, asphalt and similar materials shall be crushed prior to disposal.

## 2.2 Salvage

- .1 All items of salvageable value must be salvaged.
- .2 Provide a schedule of items to be salvaged and clearly indicate which items are to be retained by Owner. Clearly identify and tag each salvageable item.
- .3 Transport salvaged items from the site as they are removed.
- .4 Items of salvageable value to the Contractor may be removed from the structure as the work progresses, if such items are not claimed by the Owner.

## 2.3 Reuse

- .1 Salvage and reuse materials as indicated on the drawings.

## 2.4 Recycle

- .1 All materials from demolition and land clearing which can be recycled through local municipal programs and which is not scheduled for salvage shall be sorted and separated in accordance with Regional, Provincial and Municipal standards and regulations.
- .2 Provide recycling receptacles for the duration of construction activities at the building site.

## PART 3 EXECUTION

### 3.1 Examination

- .1 Survey existing conditions and correlate with requirements indicated to determine extent of demolition, salvage and recycling required.
- .2 Verify that utilities have been disconnected and capped.
- .3 Survey condition of the building to determine whether removing any element might result in a structural deficiency or unplanned collapse of any portion of the structure or adjacent structures during demolition.
- .4 Retain a licensed and qualified civil or structural engineer to provide analysis, including calculations, necessary to ensure the safe execution of the demolition work.
- .5 Perform surveys and tests as the Work progresses to detect hazards resulting from demolition activities.
- .6 Preliminary Survey:
  - .1 The Demolition Plans indicate the general extent of existing conditions based upon drawings provided by the Owner and existing site conditions. Review all areas of work to determine full extent of areas to be demolished, altered or renovated and become familiar with actual conditions and extent of work required.
  - .2 Before commencing demolition operations, examine Site and provide engineering survey to determine type of construction, condition of structure, and Site conditions. Assess strength and stability of damaged or deteriorated structures.
  - .3 Assess potential effect of removal of any part or parts on the remainder of structure before such part(s) are removed.

- .4 Assess effects of demolition at adjacent structures and consider need for underpinning, shoring and/or bracing.
- .5 Investigate for following conditions:
  - .1 load bearing walls and floors
  - .2 structure suspended from another
  - .3 effects of soils, water, lateral pressures on retaining or foundations walls
  - .4 presence of tanks and other piping systems
  - .5 presence of designated substances and hazardous materials.
- .7 After determining demolition methods, determine area of possible vibration. Carefully inspect beyond those adjacent areas. List potential damage areas and photograph each for record purposes before starting work.

### 3.2 Preparation

- .1 Erect and maintain dustproof and weatherproof partitions as required to prevent spread of dust, fumes and smoke to other parts of building. Maintain fire exits. On completion, remove partitions and make good surfaces to match adjacent surfaces of building.
- .2 Provide all shoring and bracing required for the execution of the work.
- .3 Ensure all sedimentation controls as required are in place prior to commencement of demolition activities.
- .4 Before commencing demolition, verify that existing water, gas, electrical and other services in areas being demolished are cut off, capped diverted or removed as required. Post warning signs on electrical lines and equipment which must remain energized to serve adjacent areas during period of demolition.

### 3.3 Utilities

- .1 Contact authorities or utility companies for assistance in locating and marking services passing under, through, overhead or adjacent to structure to be demolished. Such services include:
  - .1 Electrical power lines
  - .2 Gas mains
  - .3 Communication cables
  - .4 Fibre optic cables
  - .5 Water lines.
  - .6 Drainage piping (storm and sanitary).
- .2 Before disconnecting, removing, plugging or abandoning any existing utilities serving the building:
  - .1 Notify the Owner, applicable utility companies, and local authorities having jurisdiction.
  - .2 Cut off and cap utilities at the mains on the property or in the street as required by the Owner and responsible utility company. Maintain fire protection to the existing buildings at all times.
  - .3 Remove, cut off and plug, or cap all utilities within the existing building areas to be demolished, except those designated to remain

### 3.4 Protection

- .1 Erect and maintain temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction. Maintain such areas free of snow, ice, water and debris. Lighting levels shall be equal to that prior to erection.

- .2 Provide safe access and egress from working areas using entrances, hallways, stairways or ladder runs, protected to safeguard personnel using them from falling debris.
- .3 Do not interfere with use and activities of adjacent buildings and site. Maintain free and safe passage to and from buildings.
- .4 Where demolition operations prevent normal access to adjacent properties, provide and maintain suitable alternative access.
- .5 Provide flagmen where necessary or appropriate, to provide effective and safe access to site to vehicular traffic and protection to Owner's personnel. Refer to Division 1 for safety requirements.
- .6 Ensure that all necessary controls are in place at the beginning of each work period which will prevent the spread of contaminated material beyond the work area limits. Stop work immediately if there exists any possibility of the spread of contaminated materials.
- .7 Keep dust from entering existing facilities and areas of building not affected by the Work. Comply with Ministry of Health requirements regarding debris control.
- .8 Ensure scaffolds, ladders, equipment and other such equipment are not accessible to public. Protect with adequate fencing or remove and dismantle at end of each day or when no longer required.
- .9 Take precautions to guard against movement, settlement or collapse of adjacent structures, services or driveways. Be liable for such movement, settlement or collapse caused by failure to take necessary precautions. Repair promptly such damage when ordered.
- .10 If Owner considers additional bracing and shoring necessary to safeguard and prevent such movement or settlement, install bracing or shoring upon Owner's orders.
- .11 Particular attention shall be paid to prevention of fire and elimination of fire hazards which would endanger new work or existing premises.
- .12 Protect existing adjacent work against damages which might occur from falling debris or other causes due to work of this Section.
- .13 At all times protect the structure from overloading.
- .14 Provide protection around floor and/or roof openings.
- .15 Protect from weather, parts of adjoining structures not previously exposed.
- .16 Protect interiors of building parts not to be demolished from exterior elements at all times.
- .17 At end of each day's work, leave work in safe condition so that no part is in danger of toppling or falling.

### 3.5 Temporary Ventilation

- .1 Provide all required temporary ventilation for demolition work.

### 3.6 Environmental Controls

- .1 Comply with provincial and municipal regulations pertaining to water, air, solid waste, recycling, chemical waste, sanitary waste, sediment and noise pollution.
- .2 Dust Control, Air Pollution, and Odour Control: Prevent creation of dust, air pollution and odors.
  - .1 Use temporary enclosures and other appropriate methods to limit dust and dirt rising and scattering in air to lowest practical level.
  - .2 Store volatile liquids, including fuels and solvents, in closed containers.
  - .3 Properly maintain equipment to reduce gaseous pollutant emissions.
- .3 Noise Control: Perform demolition operations to minimize noise.
  - .1 Provide equipment, sound deadening devices, and take noise abatement measures that are necessary to comply with municipal regulations.
- .4 Salvage, Re-Use, and Recycling Procedures:
  - .1 Identify re-use, salvage, and recycling facilities.
  - .2 Develop and implement procedures to re-use, salvage, and recycle demolition materials.
  - .3 Identify materials that are feasible for salvage, determine requirements for site storage, and transportation of materials to a salvage facility.
  - .4 Source-separate clean and uncontaminated demolition materials including, but not limited to the following types:
    - .1 Concrete, Concrete Block, Concrete Masonry Units (CMU), Brick.
    - .2 Metal (ferrous and non-ferrous).
    - .3 Wood.
    - .4 Glass.
    - .5 Plastics and Insulation.
    - .6 Gypsum Board.
    - .7 Porcelain Plumbing Fixtures.
    - .8 Fluorescent Light Tubes.
    - .9 Paper: Bond, Newsprint, Cardboard, Paper, Packaging Materials.
    - .10 Other materials as appropriate.

### 3.7 Performance

- .1 Ensure demolition work is supervised by competent foreman at all times.
- .2 Demolition shall proceed safely in systematic manner. Work on each floor level shall be complete before commencing work on supporting structure and safety of its supports are impaired. Parts of building which would otherwise collapse prematurely shall be securely shored. Walls and piers shall not be undermined.
- .3 Until acceptance, maintain and preserve active utilities traversing premises.

### 3.8 Demolition

- .1 Review demolition procedures to ensure no personnel or equipment are located or working without additional safe working platforms or working surface adequate to support the operations.
- .2 Any damage caused to the adjacent buildings or properties by the neglect of the Contractor or any of his forces shall be made good at the expense of the Contractor including all costs and charges which may be claimed by the Owner for damages suffered.

- .3 Demolish in a manner to minimize dusting. Keep dusty materials wetted at all times.
- .4 Demolition: Use methods required to complete Work within limitations of governing regulations and as follows:
  - .1 Locate demolition equipment throughout the building and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
  - .2 Demolish concrete and masonry in sizes that will be suitable for acceptance at recycling or disposal facilities.
  - .3 Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
  - .4 Break up and remove concrete slabs on grade in small sizes, suitable for acceptance at recycling or disposal facilities, unless otherwise shown to remain.
  - .5 Remove all disconnected, abandoned utilities.
  - .6 Remove all finishes, fixtures, fittings and services as indicated
  - .7 Damages: Promptly repair damages to adjacent facilities caused by demolition operations.
  - .8 Prevent access to excavations by means of fences or hoardings.

**3.9      Selective Demolition**

- .1 Carefully dismantle and remove all items in as shown and as necessary to complete the work.
- .2 Salvage items scheduled for reuse or to be handed over to the Owner.
- .3 Particular attention shall be paid to prevention of fire and elimination of fire hazards which would endanger the existing buildings.
- .4 Where existing flooring is to be removed from floor slabs to remain, including ceramic tile flooring, carefully remove flooring, grout, adhesives, waterproofing membranes and the like down to the base slab. Patch and repair slab where damaged with concrete or acceptable leveling compound in accordance with new flooring manufacturer's instructions and ASTM F710. Refer to original building drawings and remove and replace existing concrete floor toppings as necessary and where required.
- .5 Return areas to condition existing prior to the start of the work unless indicated otherwise.

**3.10    Handling of Demolished Materials**

- .1 Conform to the approved Waste Management Plan.
- .2 Do not allow demolished materials to accumulate or be stored on-site for more than 5 days.
- .3 Do not burn, bury or otherwise dispose of rubbish and waste materials on project site.
- .4 Pallet and shrink-wrap materials scheduled for re-use and stockpile where directed on site.
- .5 Disposal: Transport demolished materials off Owner's property and legally reuse, salvage, recycle, or dispose of materials. Legally transport and dispose of materials that cannot be delivered to a source separated or mixed recycling facility to a transfer station or disposal facility that can legally accept the materials for the purpose of disposal.
- .6 Deliver to facilities that can legally accept new construction, excavation and demolition materials for purpose of re-use, recycling, composting, or disposal.

3.11 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.
- .2 Clean adjacent streets and driveways of dust, dirt and materials caused by demolition operations.
- .3 Reinstate areas and existing works outside areas of demolition to conditions that existed prior to commencement of work.
- .4 Upon completion of demolition work, remove debris, trim surfaces and leave work site clean.
- .5 Video storm and sanitary sewers and jet clean where debris may have accumulated

End of Section

## **PART 1 GENERAL**

### **1.1 General**

- .1 Conform to the requirements of Division 1.

### **1.2 Related Sections**

- .1 Section 09 21 23 Interior Painting

### **1.3 References**

- .1 ASTM International (ASTM)
  - .1 ASTM A1011/A1011M-18a Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength
  - .2 ASTM F3125/F3125M-22 Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions
- .2 CSA Group (CSA)
  - .1 CSA G40.21-13 General Requirements for Rolled or Welded Structural Quality Steel.
  - .2 CSA W47.1-09 (R2014) Certification of Companies for Fusion Welding of Steel Structures.
  - .3 CSA W59-18 Welded Steel Construction
  - .4 CSA W178.1-18 Certification of Welding Inspection Organizations
  - .5 CSA W178.2-18 Certification of Welding Inspectors
- .3 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB 1.40-97 Anticorrosive Structural Steel Alkyd Primer
- .4 Canadian Sheet Steel Building Institute (CSSBI)
  - .5 Steel Structures Painting Council, Systems and Specifications Manual.
    - .1 CISC/CPMA 1-73a-1975 A Quick drying One-coat Paint for Use on Structural Steel.
    - .2 CISC/CPMA 2-75-1975 A Quick Drying Primer for Use on Structural Steel.

### **1.4 Submittals**

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Shop Drawings:
  - .1 Submit Shop and Erection Drawings for review.
  - .2 Verify site dimensions before proceeding with shop fabrication and to suit field conditions and field openings.
  - .3 Show and describe in detail all the work of this Section including large scale detail of members and materials, of connection and jointing details, and of anchorage devices, dimensions, thicknesses, description of materials, metal finishing, as well as all other pertinent data and information, including type, size and description of all fasteners and anchors.
  - .4 Indicate connections to building structure.
  - .5 Shop drawings for all metal fabrications shall be stamped and signed by a Professional Engineer registered in the Province of Ontario. Each submission of the shop drawings shall bear the seal of the Engineer.

### **1.5 Qualifications**

- .1 Work of this Section shall be executed by a firm thoroughly conversant with laws and regulations which govern and capable of workmanship of best grade of modern shop and field practice

known to recognized manufacturers specializing in this work and having a minimum ten (10) years proven experience in the fabrication of high quality metal fabrications. Use workmen skilled in work of this Section.

- .2 Welding shall be performed by trades persons certified by The Canadian Welding Bureau under CSA Standard W47.1.

#### 1.6 Design Requirements

- .1 Design handrail construction and connections to OBC vertical and horizontal live load requirements.

#### 1.7 Examination

- .1 All dimensions shall be taken from the drawings and checked against the building. Be responsible for the correctness of such measurements and report to the Consultant in writing all discrepancies between measurements at building and those shown on drawings prior to commencing work. Verify location of anchor bolts and embedded steel and ensure that work prepared by other trades is at a proper elevation, on line, level and true.

#### 1.8 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Label, tag or otherwise mark work supplied for installation by other Sections to indicate its function, location and shop drawing description.
- .3 Protect work from damage and deliver to a location at the site in order to meet the scheduling requirements.
- .4 Protect architecturally exposed materials during fabrication, delivery, handling, storage and erection to prevent marring of surfaces exposed to view, by marking, bending, denting or coarse grinding.

#### 1.9 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

### PART 2 PRODUCTS

#### 2.1 Materials

- .1 Architectural and Miscellaneous Mild Steel: CSA G40.20-13/G40.21-13, Grade 300W.
- .2 Machine Bolts and Nuts: ASTM Standard A307-10 low carbon steel externally and internally threaded standard fasteners. Dimensions, sizes, thread, strength, quality and type of items shall be designed for the work intended. Exposed fasteners and anchors shall be same material, colour and finish as the metal to which they are applied.
- .3 High Strength Bolts and Nuts: ASTM F3125. Dimensions, sizes, thread, strength, quality and type of items shall be designed for the work intended. Exposed fasteners and anchors shall be same material, colour and finish as the metal to which they are applied.

- .4 Steel Pipe: ASTM A53 Schedule 40, Grade B.
- .5 Welding Materials: CSA W59.
- .6 Welding Electrodes: CSA W48 Series.
- .7 Isolation Coating: Alkali resistant bituminous paint to ASTM D1187.
- .8 Adhesive Anchors: HILTI or Rawl Epoxy Adhesive Anchors sized to suit loading conditions, suitable for substrate. Adhesive to be low VOC type (maximum 250 g/l) to SCAQMD Rule 1168-03, Adhesives and Sealants Applications.

## 2.2 Finishes

- .1 Primers: All primers for metal fabrications are to be factory applied under the requirements of this Section. Refer to Finish Schedules in Section 09 91 23 for types of primers required for each application. Colour to be grey.
- .2 Zinc Rich Primer: zinc rich, organic, ready mix to CAN/CGSB 1.181. Low VOC type.

## PART 3 EXECUTION

### 3.1 Fabrication

- .1 Fabricate to reviewed shop drawings and in general to details, sizes and materials indicated on drawings and specified herein.
- .2 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .3 Fabricate work complete with all components required for anchoring; bolting or welding to structural frame; standing free or resting in frames or sockets; in a safe and sure manner.
- .4 Where possible fit and shop assemble various sections of the work and deliver to site in largest practicable sections. Where shop fabricating is not possible, make trial assembly in shop.
- .5 Ensure exposed welds are continuous for length of each joint.
- .6 Grind and fill all welds after inspection and acceptance and leave ready for prime painting.
- .7 Fill all open joints, depressions, seams with metallic paste filler or by continuous brazing or welding and grind smooth to true sharp arises and profiles.
- .8 Fit joints and intersecting members accurately. Make work in true planes with adequate fastenings.
- .9 Supply all fastenings, anchors, accessories required for fabrication and erection of work of this Section. Make thread dimensions such that nuts and bolts will fit without re-threading or chasing threads.
- .10 Welding shall be done by the shielded metal-arc method in accordance with the requirements CSA W59.. The welding operators shall be currently certified under CSA W47.1 for the work they are performing.

- .11 Make exposed metal fastenings and accessories of same material, texture, colour and finish as base metal on which they occur unless otherwise shown or specified. Keep exposed fastenings to an absolute minimum evenly spaced and neatly laid out. Make fastenings of permanent type unless otherwise indicated.
- .12 Surfaces to be welded shall be free from loose scale, rust, paint, or other foreign matter. Where weld material is deposited in two or more layers, each layer shall be cleaned before the next layer is deposited. Care shall be taken to minimize stresses due to heat expansion, contraction and distortion by using proper sequence in welding and by approved methods.
- .13 Appearance, quality of welds made, methods of correcting defective work shall be in accordance with CSA W59.

### 3.2 Shop Painting

- .1 Cleaning Steel:
  - .1 Clean steel, whether it is to be painted or not, to the degree required by CISC/CPMA 1-73a, except as specified below.
  - .2 Clean steel which is specified to be painted to CISC/CPMA 2-75 in accordance with that Standard.
  - .3 Clean welds by wire brushing and wash down with clean water, to remove the chemical residues left by the electrodes, prior to painting.
- .2 The following surfaces shall not be painted:
  - .1 Surfaces and edges to be field welded. If painted, remove paint for field welding for a distance of at least 50 mm on all sides of the joint, to ensure proper fusion of the metal.
  - .2 The contact surfaces of friction type connections assembled by high strength bolts.
  - .3 Portions of steel members which are to be encased in or in contact with concrete or masonry.
  - .4 Galvanized items not specifically indicated to be painted.
- .3 Preparation and priming of all metal work which will be exposed to view and which is scheduled to be finish painted, shall be in accordance with the requirements of Section 09 91 23.
- .4 All other concealed or unpainted ferrous metal work shall be given one prime paint coat type CGSB 1.40 and in accordance with CISC/CPMA 2-75. Work paint into all corners and all joints. Metal parts in contact shall be primed before shop assembly. Priming damaged during erection or through lack of protection shall be cleaned and touched up.
- .5 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7 ° C.
- .6 Metals in contact with other dissimilar metals, concrete or masonry materials shall be insulated or separated from one another to prevent corrosion, staining or electrolysis by use of bituminous paint.

### 3.3 Miscellaneous Framing and Supports

- .1 General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- .2 Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

.1 Furnish inserts for units installed after concrete is placed.

.3 Prime miscellaneous framing and supports with primer specified in Section 09 91 23 - Interior Painting.

### 3.4 Railings

.1 Definition: the term railing shall be taken to mean balustrades, guards, rails and handrails.

.2 Design and fabricate railings to conform to all applicable Ontario Building Code requirements.

.3 Unless otherwise indicated, fabricate railings as follows:

.1 Fabricate handrails and guardrails as detailed.

.2 Pipe rails shall have an outside diameter of not more than 38 mm. Close open ends of tubular members with welded steel plugs.

.3 Extend handrails horizontally at top and bottom of each ramp as shown on the drawings but not less than 305 mm beyond stair nosing at top of stair and 610 mm at bottom of stair.

.4 Turn handrails down at exposed ends or turn into wall as detailed.

.5 Support railings at each end, and at maximum 1070 mm centres unless indicated otherwise or required to meet loading requirements of the Ontario Building Code.

.6 Minimum wall thicknesses of tubular railings: 2.5 mm.

.7 At corners, angles and intersections, cope or mitre railings, weld and grind smooth.

### 3.5 Installation

.1 Supervise the setting of bases, anchor bolts, and other steel to concrete connections. Cutting of base plates to accommodate anchor bolts is cause for rejection of base plates.

.2 Provide all bracing and shoring required to support the work of this Section during installation.

.3 Work shall be fabricated and erected square, plumb and true, straight, level and accurately fitted to size detailed on reviewed Shop Drawings. All joints shall be welded unless otherwise indicated. Exposed welds shall be ground smooth and/or flush. Exposed work shall be finished smooth and even, close joints and neat connections. Exposed welds continuous for full length of joints.

.4 Where anchors or fastenings, sleeves, have to be built in by other trades, supply all necessary templates, instructions and supervision to ensure satisfactory installation.

.5 Do all drilling, cutting and fitting necessary to attach this work to adjoining work and make it complete.

.6 Provide all components required for anchoring. Make anchoring in concealed manner where possible. Exposed anchors shall be approved by the Consultant, shall be neat, and of the same material, colour, texture and finish of base metal on which they occur. Exposed fastenings shall be evenly spaced.

.7 Grind all field welds smooth.

.8 Touch up shop coat of prime paint where damaged by field erection.

### 3.6 Fasteners and Anchors

.1 Use methods for fastening or anchoring metal fabrications to building construction as shown or

specified.

- .2 Securely anchor components in place. Unless otherwise indicated, anchor components as follows:
  - .1 To concrete and solid masonry with expansion or epoxy adhesive type anchors.
  - .2 To hollow construction with toggle bolts.
  - .3 To thin metal with screws or bolts.
  - .4 To thick metal with bolts or by welding.
  - .5 Fill space between railing members and sleeves with non-shrink grout.
- .3 Where fasteners and anchors are not shown, design the type, size, location and spacing to resist the loads imposed without deformation of the members or causing failure of the anchor or fastener, and suit the sequence of installation.
- .4 Use material and finish of the fasteners compatible with the kinds of materials which are fastened together and their location in the finished work.
- .5 Fasteners for securing metal fabrications to new construction only, may be by use of threaded or wedge type inserts or by anchors for welding to the metal fabrication for installation before the concrete is placed or as masonry is laid.
- .6 Fasteners for securing metal fabrication to existing construction or new construction may be expansion bolts, toggle bolts, power actuated drive pins, welding, self-drilling and tapping screws or bolts.

### 3.7 Schedule

- .1 General:
  - .1 Supply and install all metal fabrications indicated on Drawings, and not included in the work of other Sections.
  - .2 Coordinate and sequence the work to ensure timely delivery to the site, of all items to be built in.
  - .3 Where items are required to be built into masonry, concrete or other work supply such items to respective Sections with all anchors and accessories for building in.
  - .4 All items shall be of sizes and as detailed on drawings.
  - .5 Coordinate with Section 09 91 23 for preparation of exposed metal items required to have finish coatings applied in the field.
  - .6 Review all coordination drawings prior to installation of materials, to ensure that no interferences with the work of other Sections will occur.

### 3.8 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

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## PART 1 GENERAL

### 1.1 General

- .1 Conform to the requirements of Division 1.

### 1.2 Related Sections

- .1 Section 06 20 00 Finish Carpentry
- .2 Section 08 11 00 Metal Doors and Frames

### 1.3 References

- .1 ASTM International (ASTM)
  - .1 ASTM A123/A123M-17 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
  - .2 ASTM A653/A653M-23 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.
  - .3 ASTM D2559 - 12a(2018) Standard Specification for Adhesives for Bonded Structural Wood Products for Use Under Exterior Exposure Conditions
  - .4 ASTM F1667-21a Standard Specification for Driven Fasteners: Nails, Spikes, and Staples
- .2 CSA Group (CSA)
  - .1 CSA B111-1974(R2003) Wire Nails, Spikes and Staples.
  - .2 CSA G164-18 Hot Dip Galvanizing of Irregularly Shaped Articles.
  - .3 CSA O80 SERIES-15 Wood Preservation
  - .4 CSA O86-14 Engineering Design in Wood
  - .5 CSA O121-17 Douglas Fir Plywood.
  - .6 CSA O141:23 Canadian Standard Lumber.
  - .7 CSA O151-17 Canadian Softwood Plywood
  - .8 CSA Z809-08 Sustainable Forest Management
- .3 Underwriters Laboratories Canada (ULC)
  - .1 ULC 102-2018 Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
- .4 National Lumber Grading Authority (NGLA)
  - .1 Standard Grading Rules for Canadian Lumber, Latest Edition.
- .5 Forest Stewardship Council (FSC)
  - .1 FSC-STD-01-001-2004 FSC Principle and Criteria for Forest Stewardship.
  - .2 FSC-STD-20-002-2004 Structure and Content of Forest Stewardship Standards V2-1
  - .3 FSC Accredited Certified Bodies.

### 1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 When required by authorities having jurisdiction, submit sequential erection drawings indicating all necessary false work, temporary construction bracing and hoisting.
- .3 Submit shop drawings for wood trusses stamped and signed by a Professional Engineer registered in the Province of Ontario. Include statement that manufactured wood trusses and beams are designed in accordance with the referenced standards.
- .4 Certified Wood: Submit listing of wood products and materials used, produced from wood obtained from forests certified by FSC Accredited Certification Body in accordance with FSC-STD-01-001.

1.5 Quality Assurance

- .1 Sawn lumber shall be identified by the grade stamp of an association or independent grading agency certified by the Canadian Lumber Standards Accreditation Board.

1.6 Shipping, Handling and Storage

- .1 Protect materials, under cover, both in transit and on the site.
- .2 Store materials to prevent deterioration or the loss or impairment of their structural and other essential properties. Do not store materials in areas subject to high humidity and areas where masonry and concrete work are not completely dried out.
- .3 Store sheathing materials level and flat, in a dry location. Protect panel edges from moisture at all times.

1.7 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Materials

- .1 Timber Material shall be 'Grade Stamped'.
- .2 CSA Z809 or FSC Certified.
- .3 Construction Lumber: To CSA O141 Softwood Lumber graded to NLGA Standard Grading Rules for Canadian Lumber, published by the National Lumber Grades Authority. All lumber shall bear grade stamps. Moisture content of softwood lumber not to exceed 19% at time of installation.
  - .1 Framing lumber, plates, furring, blocking, No. 1 SPF.
  - .2 Nailing strips, furring and strapping: No. 4 S-P-F.
  - .3 Fitment framing: No. 1 S-P-F.
- .4 Canadian Softwood Plywood: to CSA O151-M, standard construction, good one or both sides as required, thickness as shown or specified.
- .5 Nails, Spikes and Staples: To ASTM F1667.
- .6 Bolts: 12.5 mm diameter, galvanized, complete with nuts and washers.
- .7 Proprietary Fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, recommended for purpose by manufacturer.
- .8 Adhesive: Contractors gun grade cartridge loaded wood adhesive, general purpose, to ASTM D2559.
- .9 Galvanizing: to CSA-G164. Use galvanized fasteners, and hardware for exterior work, preservative treated lumber, and materials in contact with concrete or masonry.

### PART 3 EXECUTION

#### 3.1 Installation

- .1 Workmanship
  - .1 Execute work using skilled mechanics according to best practice, as specified here.
  - .2 Lay out work carefully and to accommodate work of other trades. Accurately cut and fit; erect in proper position true to dimensions; align, level, square, plumb, adequately brace, and secure permanently in place. Join work only over solid backing.
- .2 Rough Hardware: Include rough hardware such as nails, bolts, nuts, washers, screws, clips, hangers, connectors, strap iron, and operating hardware for temporary enclosures.
- .3 Provide treated wood nailers, blocking, cants, grounds, furring and similar members where shown and where required for screeding or attachment of other work and surface applied items. Attach to substrate as required to support applied loading.
- .4 Blocking: Provide solid wood backing to support millwork, cabinetwork, equipment, fixtures, railings and accessories and the like, as required. Coordinate with work of other Sections and install all required backing. Any such equipment mounted on gypsum wallboard assemblies or similar assemblies shall be adequately supported.
  - .1 Provide solid wood blocking in all partitions where wall stops are specified in the hardware schedule.

#### 3.1 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

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## PART 1 GENERAL

### 1.1 General

- .1 Conform to the requirements of Division 1.

### 1.2 Related Sections

- .1 Section 05 50 00 Metal Fabrications
- .2 Section 06 10 00 Rough Carpentry
- .3 Section 06 40 00 Architectural Woodwork
- .4 Section 06 61 16 Solid Surfacing
- .5 Section 07 92 00 Joint Sealants
- .6 Section 08 11 00 Metal Doors and Frames
- .7 Section 08 14 16 Flush Wood Doors
- .8 Section 08 71 10 Door Hardware
- .9 Section 09 21 16 Gypsum Board
- .10 Section 09 91 23 Interior Painting

### 1.3 References

- .1 ASTM International (ASTM)
  - .1 ASTM E1333-22 Standard Test Method for Determining Formaldehyde Concentrations in Air and Emissions Rates from Wood Products Using a Large Chamber.
  - .2 ASTM F1667-21a Standard Specification for Driven Fasteners: Nails, Spikes, and Staples
- .2 American National Standards Institute (ANSI)
  - .1 ANSI/NEMA LD 3-2005 High Pressure Decorative Laminates
- .3 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)
  - .1 Architectural Woodwork Quality Standards Illustrated.
- .4 Canadian Plywood Association (CanPly)
  - .1 The Plywood Handbook 2005.
- .5 CSA Group (CSA)
  - .1 CSA B111-1974 (R2003) Wire Nails, Spikes and Staples.
  - .2 CSA G164-18 Hot Dip Galvanizing of Irregularly Shaped Articles.
  - .3 CSA O112 SERIES-M1977 (R2006) Standards for Wood Adhesives
  - .4 CSA O141:23 Canadian Standard Lumber.
  - .5 CSA O151-17 (R2022) Canadian Softwood Plywood
  - .6 CSA Z760-94 (R2001) Life Cycle Assessment
- .6 Forest Stewardship Council (FSC)
  - .1 FSC-STD-01-001-V4-0 FSC Principle and Criteria for Forest Stewardship.
  - .2 FSC-STD-20-002-2004, Structure and Content of Forest Stewardship Standards V2-1
  - .3 FSC Accredited Certified Bodies.
- .7 National Lumber Grades Authority (NLGA)
  - .1 Standard Grading Rules for Canadian Lumber 2005.
- .8 South Coast Air Quality Management District (SCAQMD), California State (SCAQMD)
  - .1 SCAQMD Rule 1168-03 Adhesives and Sealants Applications

### 1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit shop drawings.

- .1 Indicate details of construction, profiles, jointing, fastening and other related details.
- .2 Indicate materials, thicknesses, finishes and hardware.
- .3 Submit samples of plastic laminate materials.

1.5 Quality Assurance

- .1 Lumber by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- .2 Plywood, particleboard, OSB and wood based composite panels in accordance with CSA and ANSI standards.
- .3 Wood materials certified by Forestry Stewardship Council.

1.6 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Protect materials against dampness during and after delivery.
- .3 Store materials in ventilated areas, protected from extreme changes of temperature or humidity.

1.7 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

**PART 2 PRODUCTS**

2.1 Lumber Materials

- .1 Softwood lumber: unless specified otherwise, S4S, moisture content 19% or less in accordance with following standards:
  - .1 CSA O141.
  - .2 NLGA Standard Grading Rules for Canadian Lumber.
  - .3 AWMAC custom premium grade, moisture content as specified.
  - .4 Machine stress-rated lumber is acceptable.

2.2 Panel Materials

- .1 Canadian Softwood Plywood (CSP): to CSA O151, standard construction.
  - .1 Forestry Stewardship Council (FSC) certified.
  - .2 Urea-formaldehyde free.

2.3 Plastic Laminate

- .1 Plastic laminate facing sheet: ANSI/NEMA LD 3-2005 High-Pressure Decorative Laminates (HPDL) PF-S and GP-S;
  - .1 Backing sheet: BK Grade by manufacturer of facing sheet.
  - .2 Core: CSA O151
  - .3 Laminating adhesive: CSA O112.
  - .4 Core sealer: clear water resistant synthetic resin sealer.
  - .5 Colours, pattern, gloss and texture will be selected by Consultant from full range of products by one of the following:

- .1 Formica,
- .2 Arborite,
- .3 Wilsonart.

.6 Up to three colours and patterns will be selected by the Consultant.

#### 2.4 Accessories

- .1 Rough Hardware: Bolts, lag screws, anchors, nails and expansion shields required to secure this portion of work. Rough hardware hot dip galvanized conforming to latest edition of CSA G164. All fasteners used in damp or wet areas to be suitable for use in corrosive environment. Use hot dipped galvanized or other material approved by the Consultant.
- .2 Nails and staples: to ASTM F1667 galvanized.
- .3 Wood screws: to CSA B35.4 plain type and size to suit application.
- .4 Stainless Steel hardware: Type 316 Stainless steel for exposed or wet locations, tamper proof.
- .5 Splines: wood or metal to suit application.
- .6 Adhesive: recommended by manufacturer, waterproof type, maximum VOC limit 30 g/L SCAQMD Rule 1168 - Adhesives and Sealants Applications.

### PART 3 EXECUTION

#### 3.1 Construction

- .1 Fastening:
  - .1 Position items of finished carpentry work accurately, level, plumb, true and fasten or anchor securely.
  - .2 Design and select fasteners to suit size and nature of components being joined. Use proprietary devices as recommended by manufacturer.
  - .3 Set finishing nails to receive filler. Where screws are used to secure members, countersink screw in round smooth cut hole and plug with wood plug to match material being secured.
  - .4 Replace items of finish carpentry with damage to wood surfaces including hammer and other bruises.
- .2 Interior and exterior frames: Set frames with plumb sides, level heads and sills, and secure.

#### 3.2 Fabrication

- .1 General:
  - .1 Field measure all dimensions.
  - .2 Fabricate all finish carpentry items to AWMAC premium grade, and in accordance with the reviewed shop drawings.
  - .3 Set nails and screws, apply stained plain wood filler to indentations, sand smooth and leave ready to receive finish.
  - .4 Provide 10 mm thick solid matching wood strip on plywood and particle board edges 13 mm or thicker, exposed in final assembly.
  - .5 Ease edges of solid lumber components to 1.6 mm radius.
- .2 Plastic Laminate Components
  - .1 Unless otherwise specified herein, comply with requirements of ANSI/NEMA LD 3 Annex 'A'.

- .2 Assembly: Bond plastic laminate to core with adhesive, under pressure.
- .3 Core: unless otherwise indicated: 19 mm thick.
- .4 Balanced construction: plastic laminate covered components shall be of balanced construction, with plastic laminate on both faces of core. Seal core edges not covered with plastic laminate.
- .5 Use largest practicable plastic laminate sheet size.
- .6 Provide joints symmetrically; provide joints as corners and at changes in superficial areas; provide concealed draw bolt anchors and joints. All butt joints shall have a blind spine.
- .7 Openings and cutouts:
  - .1 Radius internal corners at least 3 mm and chamfer edges.
  - .2 Where core edge is to remain exposed, cover with plastic laminate edging.
  - .3 Where core edge is to be concealed, seal with sealer.

### 3.3 Installation

- .1 Do finish carpentry to Quality Standards of the Architectural Woodwork Manufacturers Association of Canada (AWMAC), except where specified otherwise.
- .2 All fastenings shall be concealed.
- .3 Provide heavy duty grounds as necessary for secure installation of finish carpentry work.
- .4 All wood surfaces shall be sanded smooth, ready to receive finish.
- .5 Scribe and cut as required, fit to abutting walls and surfaces, fit properly into recesses and to accommodate piping, columns, fixtures, outlets or other projecting, intersecting or penetrating objects.
- .6 Form joints to conceal shrinkage.
- .7 Set and secure materials and components in place, rigid plumb and square.
- .8 Design and select fasteners to suit size and nature of components being joined. Use proprietary devices as recommended by manufacturer.
- .9 Set finishing nails to receive filler. Where screws are used to secure members, countersink screws in round, cleanly cut hole and plug with wood plug to match material being secured.
- .10 Replace items of finish carpentry with damage to wood surfaces including hammer and other bruises.

### 3.4 Door Installation

- .1 Install doors in accordance with instructions in Section 08 11 00 and Section 08 14 16 and manufacturer's printed instructions.

### 3.5 Finish Hardware Installation

- .1 Finish hardware will be supplied for installation under this Section.
- .2 Prepare doors and frames in accordance with manufacturer's instructions and templates. Install finish hardware complete in all respects, hang doors and make adjustments necessary.
- .3 Doors shall swing freely. Where thresholds are to be used, door bottom shall be finished to suit

thresholds as required.

- .4 Where indicated on door schedules or drawings, under-cut doors.

3.6 Miscellaneous

- .1 Install Toilet and Bath Accessories as specified in Section 10 28 10, including accessories supplied by Owner.

3.7 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

## PART 1 GENERAL

### 1.1 General

- .1 Conform to the requirements of Division 1.

### 1.2 Related Sections

- .1 Section 06 10 00 Rough Carpentry
- .2 Section 06 20 00 Finish Carpentry
- .3 Section 06 61 16 Solid Surfacing
- .4 Section 07 92 00 Joint Sealants
- .5 Section 08 80 05 Glazing
- .6 Section 09 21 16 Gypsum Board

### 1.3 References

- .1 ASTM International (ASTM)
  - .1 ASTM F1667/F1667M-21a Standard Specification for Driven Fasteners: Nails, Spikes, and Staples
- .2 Architectural Woodwork Manufacturer's Association of Canada (AWMAC)
  - .1 Architectural Woodwork Standards Manual
- .3 American National Standards Institute (ANSI)
  - .1 ANSI A208.1-2009 Particleboard
  - .2 ANSI/NPA A208.2-2009 Medium Density Fibreboard (MDF)
  - .3 ANSI/HPVA HP-1-2009 Standard for Hardwood and Decorative Plywood
- .4 CSA Group (CSA)
  - .1 CSA O112 SERIES-M1977 (R2006) Wood Adhesives
  - .2 CSA O121-08 (R2013) Douglas Fir Plywood
  - .3 CSA O151-17 (R2022) Canadian Softwood Plywood
  - .4 CSA O153:19 Poplar Plywood
  - .5 CSA Z809-08 Sustainable Forest Management
- .5 Canadian General Services Board (CGSB)
  - .1 CAN/CGSB-11.3-M, Hardboard
- .6 Forest Stewardship Council (FSC)
  - .1 FSC-STD-01-001-2004 FSC Principle and Criteria for Forest Stewardship.
  - .2 FSC-STD-20-002-2004 Structure and Content of Forest Stewardship Standards V2-1
  - .3 FSC Accredited Certified Bodies.

### 1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit shop drawings conforming to AWMAC's STANDARDS (NAAWS).
  - .1 Show proposed assembly, connections, anchorage, materials, dimensions, thickness, and finishes.
  - .2 On casework and countertop elevations show location of backing required for attachment within walls.

### 1.5 Quality Assurance

- .1 Unless otherwise specified, carry out finish carpentry work in accordance with the requirements of "Millwork Standards" (latest issue) of Architectural Woodwork Manufacturers' Association of

Canada (AWMAC), Custom Grade.

- .2 Woodwork Manufacturer Qualifications:
  - .1 Minimum 5 years of production experience similar to this project, whose qualifications indicate ability to comply with requirements of this Section.
- .3 Preinstallation Conference:
  - .1 Before framing completed hold a meeting with the contractor, casework manufacturer, casework installer, and framing sub-contractor.
  - .2 Review locations of backing required for casework installation as shown on casework shop drawings.
  - .3 Review method of attachment for backing to wall system as shown on architectural drawings.

#### 1.6 Definition

- .1 "Exposed" when referred to in this Section, shall mean all parts which can be viewed and shall include interiors of cabinets, backs of doors, shelving and gables.

#### 1.7 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.
- .3 Protect against damage, including damage by excessive changes in moisture content, during delivery and storage. Maintain minimum storage temperature of 16 ° C, and relative humidity of 25% to 55%.
- .4 Cover thermally fused melamine panel faces at shop with heavy Kraft paper.
- .5 Do not deliver finish carpentry components to site before all wet trades are completed, the building is closed in and humidity conditions on site are acceptable. Do not deliver during rain or damp weather
- .6 Store materials on site in such a way as to prevent deterioration or loss or impairment of essential properties. Prevent excessive moisture gain of materials.

#### 1.8 Protection

- .1 Provide coverings as necessary to protect finish carpentry components from damage of any kind during storage and after installation.

#### 1.9 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

#### 1.10 Warranty

- .1 Warrant the work of this Section against defects of workmanship and material, for a period of two years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

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## PART 2 PRODUCTS

### 2.1 Materials

- .1 All materials CSA Z809 or FSC Certified.
- .2 Solid Wood:
  - .1 Unless otherwise indicated, provide AWMAC Custom Grade.
  - .2 All wood materials shall be new, straight and clean, free of sap, knots, pitch, and other defects, except as permitted by applicable grading rules.
  - .3 All wood shall be kiln dried to a maximum moisture content of 7%.
  - .4 Softwood: to CSA O141, dressed all sides used in concealed locations.
- .3 Particleboard: Meeting requirements of AWMAC's STANDARDS (NAAWS). To ANSI A208.1 , minimum density of 720kg/m3 Grade "R".
- .4 MDF: Medium Density Fiberboard meeting requirements of AWMAC's STANDARDS (NAAWS).
- .5 Melamine Overlaid Panels:
  - .1 Melamine overlay, heat and pressure laminated with phenolic resin to 12.7 mm thick particle board.
  - .2 Overlay bonded to both faces where exposed two sides, and when panel material require surface on one side only, reverse side to be overlaid with a plain balancing sheet.
  - .3 Furniture finish: solid colour as selected by the Consultant.
  - .4 Edge Finishing: matching melamine and polyester overlay edge strip with self-adhesive.
- .6 Thermally Fused Melamine Panels
  - .1 Thermally Fused Melamine Particleboard manufactured by Stevens Industries, Inc.
    - .1 Comply with ANSI A208.1, Grade M-2.
    - .2 Formaldehyde Emission Requirements: Less than 0.09 ppm (CARB Phase 2);
    - .3 Recycled Content 100 percent post-industrial recovered Wood fiber.
    - .4 Physical characteristics:
      - .1 Wear Resistance NEMA LD 3-2005:
        - .1 Solid Colours: 400 cycles
        - .2 Print: 125 cycles
      - .2 Stain Resistance:
        - .1 Solid Colours: 1-10 no effect
        - .2 Print: 11-15 moderate
      - .3 Impact Resistance: NEMA LD-3, 381 mm per linear m
      - .4 Fire Resistance: ASTM E-84, Class C or III
      - .5 Warping: CPA Appendix D, 3 mm per linear m
      - .6 Colour (Pattern) and texture
        - .1 Colour #G86 Grigio Notte
        - .2 Texture: Rain.
    - .2 High Pressure laminates, edge banding, moldings, cabinet doors as indicated and required.
    - .3 Particleboard panels FSC certified.
    - .4 Edgebanding: exposed edges shall be finished with thin PVC or 3mm PVC glued.
    - .5 Fabrication:
      - .1 The melamine panels should not be exposed to any clamps or assembly methods. The melamine panels should be glued and assembled with mounting dowels method or screwed with plated finish.

- .7 Fasteners and Adhesive:
  - .1 Nails and staples: ASTM F1667, galvanized, spiral head nails.
  - .2 Screws: Zinc, cadmium or chrome plated steel.
  - .3 Splines: wood or metal, to suit application.
  - .4 Adhesive: Type 1 waterproof. To CSA O112-M, type as appropriate for the intended application. Complying with ANSI/WDMA I.S-1 series. Contact bond not acceptable.
  - .5 Avoid the use of adhesives, preservatives, synthesizing agents and finish coatings that contain formaldehyde and high V.O.C. content.
- .8 Cabinet Hardware: Products listed are a standard of acceptance. Products by other manufacturers, of equal quality and similar appearance may also be accepted subject to review and approval by Consultant.
  - .1 Draw bolt fasteners: Knappe & Vogt KV 516
  - .2 Recessed Shelf Standard:
    - .1 Knappe & Vogt KV 255, Zinc, finish.
    - .2 Knappe & Vogt KV 256AL Series Aluminum Shelf Support Clip
  - .3 Hinges: Blum concealed hinges, 125° clip and 125° opening with self-closing spring. Soft close. Full or half overlay. Nickel plated steel.
  - .4 Cabinet Pulls: Richelieu D-Pull No: 30134-170, 96 mm c.c. brushed stainless steel.
  - .5 Cabinet Locks: CCL 0737 pin tumbler MK & KA by room.
  - .6 Catches: Type optional with manufacturer.
  - .7 Drawer Slides: Knappe & Vogt 8450FM Soft-Close Full-Extension Drawer Slide
  - .8 Door and Drawer Bumpers: "Quietex" bumpers.
  - .9 Provide other hardware and hardware accessories as detailed or required.
  - .10 All exposed hardware to have Platinum (Mica) finish by Teknion or equivalent unless noted otherwise.

## 2.2 Fabrication

- .1 Materials and methods of construction to meet requirements of AWMAC's STANDARDS (NAAWS) for grade or grades specified.
  - .1 If there is conflict between plans and/or specifications and AWMAC's STANDARDS (NAAWS), plans and specifications shall govern.
- .2 Wood Casework: AWMAC Standard Custom Grade.
- .3 Construction Type: Frameless
- .4 Cabinet and door interface: Flush overlay.
- .5 Exposed joints and edges:
  - .1 Uniformly space exposed joints unless otherwise indicated.
  - .2 No edge grain shall be visible; mitre external corners, house internal fasteners. Glue mitred corners.
  - .3 All exposed edges of plywood and particle board shall have solid wood edging, pressure glued. AWMAC No. 3 edge.
  - .4 Ease edges of solid lumber components to 1.6 mm radius.
- .6 Mechanical Fasteners:
  - .1 Inconspicuously locate mechanical fasteners. Wherever possible, conceal fastenings.
  - .2 Countersink nail heads.
  - .3 Where exposed to view, countersink screw and bolt heads and fill holes with matching wood plugs.

- .4 Cutting and fitting: make cut-outs in work of this Section as required to accommodate work of other Sections.
- .5 Make provisions in cabinetwork to accept built-in appliances, provided by others.

### 2.3 Casework

- .1 Construct cabinetwork components of thermally fused melamine panels as indicated and in accordance with AWMAC Custom grade.
- .2 Tenon, dado, dowel, or rabbet interior construction with all parts well glued. Shoulder mitre all exposed corners. Open ends or skeleton frames against walls are not permitted. Unless otherwise permitted by Consultant, use unitized construction system for all components.
- .3 Exposed Surfaces: Thermally Fused Melamine Panels (TFMP), meeting requirements of AWMAC's Standards (NAAWS) for Grade specified.
- .4 Construct door and drawer fronts of 19 mm thermally fused melamine panels.
- .5 Exposed interior surfaces: LPDL of a colour and pattern compatible with exposed surfaces
- .6 Semi-exposed surfaces: LPDL
- .7 Rout gables for pilaster strips where adjustable shelving is required.
- .8 Construct shelving with edge moulding to match. Shelving to cabinetwork to be adjustable unless otherwise noted.
- .9 Apply moisture repellent sealer to concealed backs of cabinetwork.
- .10 Install cabinet hardware in accord with hardware manufacturer's directions. Unless otherwise indicated, provide each door with pull and with minimum two hinges. Provide locks where indicated.

### 2.4 Drawers

- .1 Sides: Particle board with melamine surfaces.
- .2 Bottoms: MDF or hardboard with melamine surfaces
- .3 Joinery: Meeting requirements of AWMAC's STANDARDS (NAAWS) for Grade specified.

### 2.5 Solid Surface Countertops

- .1 As specified in Section 06 61 16.

### 2.6 Finishes

- .1 All exposed exterior surfaces: Thermally fused melamine panels as indicated. Colours selected by the Consultant.
- .2 All exposed interior surfaces: melamine unless indicated otherwise.
- .3 Cabinet and case backs unexposed to view shall be back primed with one coat of moisture

repellent sealer.

- .4 Apply finishes in accordance with the AWMAC Manual.
- .5 Stainless Steel: Type 316 stainless steel, brushed finish.

### PART 3 EXECUTION

#### 3.1 Examination

- .1 Verify mechanical, electrical, plumbing, HVAC and other building components, affecting work in this Section are in place and ready.
- .2 Verify HVAC controls and systems are operating properly.
- .3 Verify adequacy of backing and support framing. Advise Contractor of areas and surfaces requiring further modifications for plumb, level, even or square fitting.

#### 3.2 Installation

- .1 Install work in accordance with AWMAC Installation Manual, Custom grade.
- .2 Secure all work in place, square, plumb, and level.
- .3 Accurately scribe and closely fit components to irregularities of adjacent surfaces.
- .4 Accurately fit joints in true plane, locate joints over bearing or supporting surfaces.
- .5 Countersink mechanical fasteners used at exposed and semi-exposed surfaces, excluding installation attachment screws and those securing cabinets end to end.
- .6 Where permitted, nail with small headed finishing nails. Countersink nail heads with nail setter.
- .7 Install thermally fused melamine panel components using concealed fastening devices.
- .8 Where components are fastened with screws or bolts, countersink screw and bolt heads and provide wood plugs matching surrounding wood.
- .9 Where cabinetwork abuts other building elements, provide wood trim matching cabinetwork except where otherwise detailed.
- .6 Cut equipment cutouts shown on plans using templates provided.
  - .1 Radius internal corners at least 3 mm and chamfer edges.
  - .2 Where core edge is to remain exposed, cover with melamine edging.
  - .3 Where core edge is to be concealed, seal with sealer.
- .10 Where access is required to valves and other mechanical and electrical components, located behind cabinetwork, provide removable plywood access panels of size required and secure with four brass screws.
- .11 Apply mildew resistant silicone sealant to perimeter of all countertops as specified in Section 07 92 00.

3.3 Adjustment

- .1 Adjust all moving and operating parts to function smoothly and correctly.
- .2 Fill and retouch all nicks, chips and scratches. Replace all un-repairable damaged items.
- .3 Replace damaged components which, in the opinion of the Consultant, cannot be satisfactorily repaired.

3.4 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.
- .2 Upon completion of installation, clean installed items of pencil and ink marks and broom clean the area of operation.

End of Section

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PART 1 GENERAL

1.1 General

- .1 Conform to the requirements of Division 1.

1.2 Related Sections

- .1 Section 06 40 00 Architectural Woodwork
- .2 Section 07 92 00 Joint Sealants

1.3 References

- .1 ASTM International (ASTM)
  - .1 ASTM E84-23d Standard Test Method for Surface Burning Characteristics of Building Materials
- .2 CSA Group (CSA)
  - .1 CSA O151-17 Canadian Softwood Plywood
- .3 Architectural Woodwork Institute (AWI)
  - .1 AWI/AWMAC/WI's Architectural Woodwork Standards
- .4 International Surface Fabricators Association (ISFA)
  - .1 ISFA 2-01 (2013) Classification and Standards for Solid Surfacing Material
- .5 American National Standards Institute (ANSI)
  - .1 ANSI ICPA-SS-1 (2001) Performance Standard for Solid Surface Materials

1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Product Data: Include detailed specification of construction and fabrication, manufacturer's installation instructions, and manufacturer's detailed recommendations for handling, storage, installation, protection, and maintenance.
- .3 Shop Drawings: For countertops. Show materials, finishes, edge and backsplash profiles, methods of joining, terminations, and cutouts.
  - .1 Show locations and details of joints.
  - .2 Show direction of directional pattern, if any.
- .4 Samples:
  - .1 Full range of colours and patterns for initial selection by Consultant.
  - .2 Samples of three colours, 76 x 76 mm for final selection by Consultant.
- .5 Certificates: For the following certifications:
  - .1 United States Food and Drug Administration (FDA) compliance for food contact materials described in 21 CFR 174 to 21 CFR 190.
  - .2 ANSI/NSF 51 "food zone" and FDA "direct-food contact" compliant.
- .6 Provide maintenance data for solid surface material countertops for incorporation into Operation and Maintenance Manual specified in Section 01 78 00 – Closeout Submittals.

1.5 Quality Assurance

- .1 Source Limitations: Obtain materials and products from single source.

- .2 Fabricator Qualifications: Certified solid surface fabricator/installer.
- .3 Installer Qualifications: Firm experienced in installation or application of systems similar in complexity to those required for this Project, including specific requirements indicated.
  - .1 Acceptable to or licensed by manufacturer.

1.6 Field Conditions

- .1 Field Measurements: Verify dimensions of countertops by field measurements after base cabinets are installed but before countertop fabrication is complete.
- .2 Coordinate locations of utilities that will penetrate countertops or backsplashes.

1.7 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.
- .3 Handle in a manner to prevent breakage. Brace parts if necessary. Transport in the near vertical position with finished face toward finished face. Do not allow finished surfaces to rub during shipping and handling.
- .4 Store in racks in near vertical position. Prevent warpage and breakage. Store Inside away from direct exposure to sunlight.

1.8 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

1.9 Warranty

- .1 Furnish manufacturer's 10-year material warranty.

**PART 2 PRODUCTS**

2.1 Manufacturer

- .1 Manufacturer: Products of following manufacturers are acceptable subject to conformance to requirements of drawings and specifications:
  - .1 Corian by DuPont

2.2 Solid Surface Material

- .1 Composition Solid-Surface Material: Homogeneous-filled plastic resin complying with ICPA SS-1 and ISFA-2.
- .2 Panel thickness: 12.7 mm.
- .3 Panel weight: 21.5 kg/m<sup>2</sup>
- .4 Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of an applicable testing agency.

- .1 Flame-Spread Index: 25 or less.
- .2 Smoke-Developed Index: 50 or less.
- .3 Flammability: To NFPA 101, Class A.

.5 Pattern and Finish: Corian Coarse Botticino.

.6 Particleboard: ANSI A208.1, Grade M-2-Exterior Glue.

## 2.1 Accessories

- .1 Adhesive for bonding to other products: as recommended by solid surface material manufacturer.
- .2 Sealant for countertops: Comply with applicable requirements in Section 07 92 00.

## 2.2 Fabrication

- .1 Fabricate countertops according to solid surface material manufacturer's written instructions and to the AWI/AWMAC/WI Architectural Woodwork Standards.
- .2 Grade: Premium.
- .3 Configuration:
  - .1 Front: Pencil round edge 3.0 mm radius.
- .4 Countertops: 12.7 mm thick, solid surface material with front edge built up with same material, laminated to 19 mm hardboard.
- .5 Fabricate tops with shop-applied edges unless otherwise indicated. Comply with solid surface material manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.
- .6 Joints: Fabricate countertops in sections for joining in field, with joints at locations indicated on reviewed shop drawings.
  - .1 Joint Locations: Not within 76 mm of a cutout or cooktop, 25 mm from inside corner for conventional seams, and not where countertop sections less than 900 mm long would result, unless unavoidable.
- .7 Cutouts and Holes:
  - .1 Undercounter Plumbing Fixtures: Make cutouts for fixtures in shop using template or pattern furnished by fixture manufacturer. Form cutouts to smooth, even curves.
    - .1 Provide vertical edges, slightly eased at juncture of cutout edges with top and bottom surfaces of countertop.
    - .2 Provide vertical edges, rounded to 10 mm radius at juncture of cutout edges with top surface of countertop, slightly eased at bottom.
  - .2 Counter-Mounted Plumbing Fixtures: Prepare countertops in shop for field cutting openings for counter-mounted fixtures. Mark tops for cutouts and drill holes at corners of cutout locations. Make corner holes of largest radius practical.
  - .3 Fittings: Drill countertops in shop for plumbing fittings and similar items.

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## PART 3 EXECUTION

### 3.1 Examination

- .1 Examine substrates to receive solid surfacing. Identify conditions detrimental to proper or timely installation. Do not commence installation until conditions have been corrected.
- .2 Verify that substrates supporting solid surfacing are plumb, level, and flat to within 3.0 mm/3.0 metres.

### 3.2 Preparation

- .1 Precondition solid surfacing in accordance with manufacturer's printed instructions.

### 3.3 Installation

- .1 Install components plumb and level, in accordance with reviewed shop drawings, Project installation details, and manufacturer's printed instructions.
- .2 Joints between adjacent pieces of surfacing shall be flush, tight fitting, level, and neat. Securely join adjacent pieces with manufacturer's adhesive. Fill joints level to polished surface.
- .3 Install countertops level to a tolerance of 3 mm in 2.4 m, 6 mm maximum. Do not exceed 0.4 mm difference between planes of adjacent units.
- .4 Fasten countertops by adhering with 100-percent silicone material in dab format (not bead format) to base units into underside of countertop at 457 to 610 mm o.c. Shim as needed to align subtops in a level plane.
- .5 Align adjacent surfaces and, using adhesive in colour to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
- .6 Bond joints with adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to joints to prevent adhesive smears.
- .7 Clamp units to temporary bracing, supports, or each other to ensure that countertops are properly aligned and joints are of specified width.
- .8 Install backsplashes and end splashes by adhering to wall and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears.
- .9 Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts to prevent damage while cutting. Make cutouts to accurately fit items to be installed, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.
- .10 Apply mildew resistant silicone sealant to perimeter of all countertops as specified in Section 07 92 00.

3.4 Protection

- .1 Protect surfaces from damage until date of Substantial Performance. Repair or replace damaged components that cannot be repaired to Consultant's satisfaction.

3.5 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

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## PART 1 GENERAL

### 1.1 General

- .1 Conform to the requirements of Division 1.

### 1.2 Related Sections

- .1 Section 07 92 00 Joint Sealants
- .2 Section 09 21 16 Gypsum Board

### 1.3 References

- .1 ASTM International (ASTM)
  - .1 ASTM E84-23d Standard Test Method for Surface Burning Characteristics of Building Materials
  - .2 ASTM E119-20 Standard Test Methods for Fire Tests of Building Construction and Materials
  - .3 ASTM E136-19a Standard Test Method for Behavior of Material in a Vertical Tube Furnace at 750° C
  - .4 ASTM E814-13a (2017) Standard Test Method for Fire Tests of Penetration Firestop Systems
  - .5 ASTM E1966-15(2019) Standard Test Method for Fire-Resistive Joint Systems
  - .6 ASTM E2307-20 Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus
- .2 Underwriter's Laboratories of Canada (ULC)
  - .1 ULC 101-2014 Standard Methods of Fire Endurance Tests of Building Construction and Materials
  - .2 ULC 102.2-2018 Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies
  - .3 ULC 115-2018 Standard Method of Fire Tests of Firestop Systems
- .3 National Fire Protection Association (NFPA)
  - .1 NFPA 252 Standard Methods of Fire Test and Door Assemblies
- .4 South Coast Air Quality Management District (SCAQMD) California State
  - .1 SCAQMD Rule 1168-03: Adhesives and Sealants.
- .5 Ontario Building Code

### 1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Product Data: Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings: Submit shop drawings to show location, proposed material, reinforcement, anchorage, fastenings and method of installation. Construction details should accurately reflect actual job conditions.
- .4 Samples: Submit duplicate 300 x 300 mm samples showing actual fire stop material proposed for project.
- .5 Quality Assurance Submittals: submit following in accordance with Section 01 45 00 - Quality Control.
  - .1 Test reports: in accordance with ULC 101 for fire endurance and ULC 102 for surface burning

- characteristics.
- .2 Submit certified test reports from approved independent testing laboratories, indicating compliance of applied fire stopping with specifications for specified performance characteristics and physical properties
- .3 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .4 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures.

#### 1.5 Definitions

- .1 Fire Stop Material: device intended to close off opening or penetration during fire or materials that fill openings in wall or floor assembly where penetration is by cables, cable trays, conduits, ducts and pipes and poke-through termination devices, including electrical outlet boxes along with their means of support through wall or floor openings.
- .2 Single Component Fire Stop System: fire stop material that has Listed Systems Design and is used individually without use of high temperature insulation or other materials to create fire stop system.
- .3 Multiple Component Fire Stop System: exact group of fire stop materials that are identified within Listed Systems Design to create on site fire stop system.

#### 1.6 Quality Assurance

- .1 One installer shall install all firestopping on the project. Each trade shall not firestop their own service penetrations. Installer shall be certified by fire stopping manufacturer.
- .2 Qualifications:
  - .1 Qualified Installer: specializing in fire stopping installations with 5 years documented experience approved and trained by manufacturer.
- .3 Pre-Installation Meetings: convene pre-installation meeting one week prior to beginning work of this Section, with contractor's representative and Consultant to:
  - .1 Verify project requirements.
  - .2 Review installation and substrate conditions.
  - .3 Co-ordination with other building subtrades.
  - .4 Review manufacturer's installation instructions and warranty requirements.
- .4 Site Meetings:
  - .1 As part of Manufacturer's Services described in 3.5- Field Quality Control, schedule site visits, to review Work, at stages listed.
  - .2 After delivery and storage of products, and when preparatory Work is complete, but before installation begins.
  - .3 Twice during progress of Work at 25% and 60% complete.
  - .4 Upon completion of Work, after cleaning is carried out.
  - .5 Single Source Responsibility: Obtain through-penetration fire-stop systems for each kind of penetration and construction condition indicated from a single manufacturer.
- .5 Field-Constructed Mockup: Prior to installing fire-stopping, erect mockups for each different through-penetration fire-stop system indicated to verify selections made and to demonstrate qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for final installations.

- .1 Locate mockups on site in locations indicated or, if not indicated, as directed by Consultant.
- .2 Notify Consultant one week in advance of the dates and times when mockups will be erected.
- .3 Obtain Consultant's acceptance of mockups before start of final unit of Work.
- .4 Retain and maintain mockups during construction in an undisturbed condition as a standard for judging completed unit of Work.
- .5 Accepted mockups in an undisturbed condition at time of Substantial Performance may become part of completed unit of Work.

**1.7**      Sustainable Requirements

- .1 Materials shall be Low VOC type conforming to SCAQMD Rule 1168-03. Maximum VOC level of firestopping materials shall be 250 g/l.

**1.8**      Project Conditions

- .1 Environmental Conditions: Do not install fire-stopping when ambient or substrate temperatures are outside limits permitted by fire-stopping manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
- .2 Ventilation: Ventilate fire-stopping per fire-stopping manufacturers' instructions by natural means or, where this is inadequate, forced air circulation.

**1.9**      Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.
- .3 Deliver materials to the site in undamaged condition and in original unopened containers, marked to indicate brand name, manufacturer, ULC markings.
- .4 Storage and Protection:
  - .1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Replace defective or damaged materials with new.

**1.10**    Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

**PART 2**   PRODUCTS

**2.1**      Materials

- .1 All fire stopping shall consist of ULC listed firestop system.
- .2 Applications: Provide fire-stopping systems composed of materials specified in this Section that comply with system performance and other requirements.
- .3 General: Provide fire-stopping systems that are produced and installed to resist the spread of fire, according to requirements indicated, and the passage of smoke and other gases.
- .4 All firestopping material shall be:

- .1 From one manufacturer;
- .2 Intumescent where an appropriate system exists.
- .5 Fire stopping and smoke seal systems: ULC listed in accordance with ULC 115.
  - .1 Asbestos-free materials and systems capable of maintaining effective barrier against flame, smoke and gases in compliance with requirements of ULC 115 and not to exceed opening sizes for which they are intended.
- .6 Service penetration assemblies: ULC listed systems tested to ULC 115.
- .7 Service penetration fire stop components: ULC listed and certified by test laboratory to ULC 115.
- .8 Fire-resistance rating of installed fire stopping assembly in accordance with NBC.
- .9 Fire stopping and smoke seals at openings intended for ease of re-entry such as cables: elastomeric seal.
- .10 Fire stopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: elastomeric seal.
- .11 Primers: to manufacturer's recommendation for specific material, substrate, and end use.
- .12 Water: potable, clean and free from injurious amounts of deleterious substances.
- .13 Damming and backup materials, supports and anchoring devices: to manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.
- .14 F-Rated Through-Penetration Fire-stop Systems: Provide through-penetration fire-stop systems with F ratings indicated, but not less than that equaling or exceeding the fire-resistance rating of the constructions penetrated.
- .15 T-Rated Through-Penetration Fire-stop Systems: Provide through-penetration fire-stop systems with T ratings, in addition to F ratings, where indicated and where systems protect penetrating items exposed to contact with adjacent materials in occupy-able floor areas. T-rated assemblies are required where the following conditions exist:
  - .1 Where fire-stop systems protect penetrations located outside of wall cavities.
  - .2 Where fire-stop systems protect penetrations located outside fire-resistive shaft enclosures.
  - .3 Where fire-stop systems protect penetrations located in construction containing doors required to have a temperature-rise rating.
  - .4 Where fire-stop systems protect penetrating items larger than a 100 mm diameter nominal pipe or 10,000 mm<sup>2</sup> in overall cross-sectional area.
- .16 Fire-Resistive Joint Sealants: Provide joint sealants with fire-resistance ratings indicated, but not less than that equaling or exceeding the fire-resistance rating of the construction in which the joint occurs. Sealants for vertical joints: non-sagging.
- .17 For fire-stopping exposed to view, traffic, moisture, and physical damage, provide products that do not deteriorate when exposed to these conditions.
  - .1 For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration fire-stop systems.
  - .2 For floor penetrations with annular spaces exceeding 100 mm or more in width and exposed to possible loading and traffic, provide fire-stop systems capable of supporting the floor loads

- involved either by installing floor plates or by other means.
- .3 For penetrations involving insulated piping, provide through-penetration fire-stop systems not requiring removal of insulation.
- .18 For firestopping exposed to view, provide products with flame-spread values of less than 25 and smoke-developed values of less than 450.
- .19 Compatibility: Provide fire-stopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by fire-stopping manufacturer based on testing and field experience.
- .20 Accessories: Provide components for each fire-stopping system that are needed to install fill materials and to comply with "System Performance Requirements". Use only components specified by the fire-stopping manufacturer and approved by the qualified testing and inspecting agency for the designated fire resistance-rated systems. Accessories include but are not limited to the following items:
- .1 Permanent forming/damming/backing materials including the following:
- .1 Semi-refractory fibre (mineral wool) insulation.
  - .2 Ceramic fibre.
  - .3 Sealants used in combination with other forming/damming materials to prevent leakage of fill materials in liquid state.
  - .4 Fire-rated formboard.
  - .5 Joint fillers for joint sealants.
- .2 Temporary forming materials.
- .3 Substrate primers.
- .4 Collars.
- .5 Steel sleeves.

### **PART 3 EXECUTION**

#### **3.1 Manufacturer's Instructions**

- .1 Compliance: comply with manufacturer's written recommendations or specifications.

#### **3.2 Preparation**

- .1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials.
- .2 Ensure that substrates and surfaces are clean, dry and frost free.
- .3 Prepare surfaces in contact with fire stopping materials and smoke seals to manufacturer's instructions.
- .4 Maintain insulation around pipes and ducts penetrating fire separation without interruption to vapour retarder.
- .5 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.

#### **3.3 Installation**

- .1 Install fire stopping and smoke seal material and components in accordance with manufacturer's certified tested system listing and as necessary to maintain fire resistance ratings of floor and wall assemblies.
- .2 Provide fire stopping for all disciplines.
- .3 Seal holes or voids made by through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separation are maintained.
- .4 Fill spaces between openings, ducts, pipes and unused sleeves passing through fire separations with firestop material and install firestopping systems in accordance with the appropriate ULC system number for the products and type of penetration.
- .5 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.
- .6 Tool or trowel exposed surfaces to neat finish.
- .7 Remove excess compound promptly as work progresses and upon completion.

### 3.4 Sequences of Operation

- .1 Proceed only when submittals have been reviewed by Consultant.
- .2 Mechanical pipe insulation: certified fire stop system component.
  - .1 Ensure pipe insulation installation precedes fire stopping.

### 3.5 Field Quality Control

- .1 Inspections: notify Consultant when ready for inspection and prior to concealing or enclosing fire stopping materials and service penetration assemblies.
- .2 Employ a ULC accredited Designated Responsible Individual (DRI) to inspect and label all fire stop applications on site.
- .3 Manufacturer's Field Services:
  - .1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in Article 1.4 - Submittals.
  - .2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
  - .3 Schedule site visits, to review Work, as directed in Article 1.6 - Quality Assurance.

### 3.6 Commissioning

- .1 Employ a ULC accredited Designated Responsible Individual (DRI) to inspect and label all fire stop applications on site. Submit DRI's written reports within 3 days of review, verifying compliance of Work.
- .2 Perform a thorough examination of the fire stopping system to determine if the assembly is installed as per its ULC listing.

- .3 Allow for destructive testing of installed firestopping. Repair all tested assemblies.
- .4 The examination shall take place prior to close-up to confirm assembly components and installation configuration.
- .5 Any and all deviations from the ULC listed system shall be considered grounds for rejection and replacement.

### 3.7 Schedule

- .1 Fire stop and smoke seal at:
  - .1 Penetrations through fire-resistance rated partitions and walls.
  - .2 Perimeter of fire-resistance rated partitions.
  - .3 Intersection of fire-resistance rated partitions.
  - .4 Control and sway joints in fire-resistance rated partitions and walls.
  - .5 Penetrations through fire-resistance rated floor slabs, ceilings and roofs.
  - .6 Around mechanical and electrical assemblies penetrating fire separations.
  - .7 Rigid ducts: greater than 129 cm<sup>2</sup>: fire stopping to consist of bead of fire stopping material between retaining angle and fire separation and between retaining angle and duct, on each side of fire separation.
  - .8 All electrical boxes installed in fire rated gypsum board assemblies.
  - .9 All locations required by the Ontario Building Code.
  - .10 Any other locations indicated.

### 3.8 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.
- .3 Remove temporary dams after initial set of fire stopping and smoke seal materials.

End of Section

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## PART 1 GENERAL

### 1.1 General

- .1 Conform to the requirements of Division 1.

### 1.2 Related Sections

- .1 Section 06 10 00 Rough Carpentry
- .2 Section 06 20 00 Finish Carpentry
- .3 Section 06 40 00 Architectural Woodwork
- .4 Section 07 84 00 Firestopping
- .5 Section 08 80 05 Glazing

### 1.3 References

- .1 ASTM International (ASTM)
  - .1 ASTM C510-16(2022) Standard Test Method for Staining and Color Change of Single- or Multicomponent Joint Sealants
  - .2 ASTM C661-15(2022) Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer
  - .3 ASTM C679-15(2022) Standard Test Method for Tack-Free Time of Elastomeric Sealants
  - .4 ASTM C719-22 Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle)
  - .5 ASTM C793-05(2017) Standard Test Method for Effects of Laboratory Accelerated Weathering on Elastomeric Joint Sealants
  - .6 ASTM C794-18(2022) Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants
  - .7 ASTM C834-17 Standard Specification for Latex Sealants
  - .8 ASTM C919-22 Standard Practice for Use of Sealants in Acoustical Applications
  - .9 ASTM C920-18 Standard Specification for Elastomeric Joint Sealants
  - .10 ASTM C1087-23 Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems
  - .11 ASTM C1183/C1183M-13(2018) Standard Test Method for Extrusion Rate of Elastomeric Sealants
  - .12 ASTM C1193-16 Standard Guide for Use of Joint Sealants
  - .13 ASTM C1246-17(2022) Standard Test Method for Effects of Heat Aging on Weight Loss, Cracking, and Chalking of Elastomeric Sealants After Cure
  - .14 ASTM C1247-20 Standard Test Method for Durability of Sealants Exposed to Continuous Immersion in Liquids
  - .15 ASTM C1248-22 Standard Test Method for Staining of Porous Substrate by Joint Sealants
  - .16 ASTM C1311-22 Standard Specification for Solvent Release Sealants
  - .17 ASTM C1330-23 Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants.
  - .18 ASTM D412-16(2021) Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension
  - .19 ASTM D2203-01(2023) Standard Test Method for Staining from Sealants
  - .20 ASTM E84-23c Standard Test Method for Surface Burning Characteristics of Building Materials
  - .21 ASTM E90-09(2016) Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
- .2 Department of Justice Canada (Jus)
  - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .3 U. S. Environmental Protection Agency (EPA)

- .1 EPA 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings.
- .4 South Coast Air Quality Management District (SCAQMD) California State
  - .1 SCAQMD Rule 1168-03: Adhesives and Sealants.

#### 1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit product data for all sealant materials and accessories including:
  - .1 Preparation instructions and recommendations.
  - .2 Standard drawings illustrating manufacturer's recommended sealant joint profiles and dimensions applicable to Project.
- .3 Joint Sealant Schedule: Indicate joint sealant location, joint sealant type, manufacturer and product name, and colour, for each application. Utilize joint sealant designations included in this Section.

#### 1.5 Quality Assurance

- .1 Installer Qualifications: Company with minimum of three years of experience specializing in work of this section, employing applicators trained for application of joint sealants required for this project, with record of successful completion of projects of similar scope, and approved by manufacturer.
- .2 Single Source Responsibility: Provide joint sealants by a single manufacturer responsible for testing of Project substrates to verify compatibility and adhesion of joint sealants.
- .3 Caulking work shall be carried out in strict accordance with manufacturer's printed directions.
- .4 Adhesion: Use ASTM C719 and ASTM C794 to determine requirements for joint preparation, including cleaning and priming.
- .5 Compatibility: Use ASTM C1087 to determine materials forming joints and adjacent materials do not adversely affect sealant materials and do not affect sealant colour.
- .6 Stain Testing: Use ASTM C510, ASTM C1248, or ASTM D2203 to verify non-staining characteristics of proposed sealants on specified substrates.

#### 1.6 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.

#### 1.7 Project Conditions

- .1 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.
- .2 Ventilate area of work by use of approved portable supply and exhaust fans.

#### 1.8 Scheduling

- .1 Ensure sealants are cured before covering with other materials.

1.9 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Manufacturer

- .1 Basis-of-Design Products: Provide joint sealant products manufactured by Tremco, Inc., Commercial Sealants and Waterproofing, 220 Wicksteed Avenue, Toronto, www.tremcosealants.com, or comparable products of other manufacturer approved by Consultant.

2.2 Materials, General

- .1 VOC Content for Interior Applications: Provide sealants and sealant primers complying with the following VOC content limits per 40 CFR 59, Subpart D (EPA Method 24):
- .1 Architectural Sealants: 250 g/L.
  - .2 Sealant Primers for Nonporous Substrates: 250 g/L.
  - .3 Sealant Primers for Porous Substrates: 775 g/L.
- .2 Low-Emitting Sealants for Interior Applications: Provide sealants and sealant primers complying with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- .3 Compatibility: Provide joint sealants and accessory materials that are compatible with one another, and with adjacent materials, as demonstrated by sealant manufacturer using ASTM C1087 testing and related experience.
- .4 Joint Sealant Standard: Comply with ASTM C920 and other specified requirements for each joint sealant.
- .5 Stain Test Characteristics: Where sealants are required to be non-staining, provide sealants tested per ASTM C1248 as non-staining on porous joint substrates specified.

2.3 Silicone Joint Sealants

- .1 SJS#1: Mildew-Resistant, Single-Component, Acid-Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 25, Use NT.
- .1 Basis of Design Product: Tremco Tremsil 200 Sanitary.
  - .2 Volatile Organic Compound (VOC) Content: 1 g/L maximum.
  - .3 Volatile Organic Emissions (VOE): Not greater than Greenguard Children & Schools Certification emissions levels.
  - .4 Colour: White and Clear.

2.4 Urethane Joint Sealants

- .1 UJS#1: Single-Component, Nonsag, Moisture-Cure, Polyurethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 50, Use NT; Greenguard certified.
- .1 Basis of Design Product: Tremco Dymonic 100.
  - .2 Volatile Organic Compound (VOC) Content: 40 g/L maximum.
  - .3 Volatile Organic Emissions (VOE): Not greater than Greenguard Children & Schools Certification emissions levels.

- .4 Tensile Strength ASTM D412: 350 to 450 psi
- .5 Percent Elongation ASTM D412: 800 to 900%
- .6 Modulus at 100% ASTM D412: 75 to 85 psi
- .7 Tear Strength ASTM D412: 65 to 75 psi
- .8 Smoke Development ASTM E84: 5
- .9 Colour: As selected by Consultant from manufacturer's standard line.

## 2.5 Latex Joint Sealants

- .1 LJS#1: Latex Joint Sealant: Siliconized acrylic latex, ASTM C834, Type OP, Grade NF.
  - .1 Basis of Design Product: Tremco Tremflex 834.
  - .2 Volatile Organic Compound (VOC) Content: 35 g/L maximum.
  - .3 Volatile Organic Emissions (VOE): Not greater than Greenguard Children & Schools Certification emissions levels.
  - .4 Colour: White, paintable.

## 2.6 Acoustical Sealants

- .1 AJS#1: Acoustical/Curtainwall Sealant: Single-component, non-hardening, non-sag, paintable synthetic rubber-tested to reduce airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing of similar assemblies according to ASTM E90.
  - .1 Basis of Design Product: Tremco Acoustical/Curtainwall Sealant.
  - .2 Volatile Organic Compound (VOC) Content: 160 g/L maximum.
  - .3 Colour: White, paintable.

## 2.7 Joint Sealant Accessories

- .1 Cylindrical Sealant Backing: ASTM C1330, Type B non-absorbent, bi-cellular material with surface skin, or Type O open-cell polyurethane, as recommended by sealant manufacturer for application.
- .2 Bond Breaker Tape: Polymer tape compatible with joint sealant and adjacent materials and recommended by sealant manufacturer.
- .3 Joint Substrate Primers: Substrate primer recommended by sealant manufacturer for application.
- .4 Cleaners: Chemical cleaners acceptable to joint sealant manufacturer.
- .5 Masking tape: Non-staining, non-absorbent tape product compatible with joint sealants and adjacent joint surfaces.

# PART 3 EXECUTION

## 3.1 Examination

- .1 Examine joint profiles and surfaces to determine if work is ready to receive joint sealants. Verify joint dimensions are adequate for development of sealant movement capability. Verify joint surfaces are clean, dry, and adequately cured. Proceed with joint sealant work once conditions meet sealant manufacturer's written recommendations.

### 3.2 Preparation

- .1 Joint Surface Cleaning: Clean joints prior to installing joint sealants using materials and methods recommended by sealant manufacturer. Comply with ASTM C1193.
  - .1 Remove curing compounds, laitance, form-release agents, dust, and other contaminants.
  - .2 Clean nonporous and porous surfaces utilizing chemical cleaners acceptable to sealant manufacturer.
  - .3 Protect elements surrounding the Work of this section from damage or disfiguration. Apply masking tape to adjacent surfaces when required to prevent damage to finishes from sealant installation.

### 3.3 Application

- .1 Sealant and Primer Installation Standard: Comply with ASTM C1193 and manufacturer's written instructions.
- .2 Joint Backing: Select joint backing materials recommended by sealant manufacturer as compatible with sealant and adjacent materials. Install backing material at depth required to produce profile of joint sealant allowing optimal sealant movement.
  - .1 Install joint backing to maintain the following joint ratios:
    - .1 Joints up to 13 mm wide: 1:1 width to depth ratio.
    - .2 Joints greater than 13 mm wide: 2:1 width to depth ratio; maximum 13 mm joint depth.
  - .2 Install bond breaker tape over substrates when sealant backings are not used.
- .3 Masking: Mask adjacent surfaces to prevent staining or damage by contact with sealant or primer.
- .4 Joint Priming: Prime joint substrates when recommended by sealant manufacturer or when indicated by preconstruction testing or experience. Apply recommended primer using sealant manufacturer's recommended application techniques.
- .5 Liquid Sealant Application: Install sealants using methods recommended by sealant manufacturer, in depths recommended for application. Apply in continuous operation from bottom to top of joint vertically and horizontally in a single direction. Apply using adequate pressure to fill and seal joint width.
  - .1 Tool sealants immediately with appropriately shaped tool to force sealants against joint backing and joint substrates, eliminating voids and ensuring full contact.
  - .2 Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
  - .3 Tool exposed joint surface concave using tooling agents approved by sealant manufacturer for application.
- .6 Cleaning: Remove excess sealant using materials and methods approved by sealant manufacturer that will not damage joint substrate materials.
  - .1 Remove masking tape immediately after tooling joint without disturbing seal.
  - .2 Remove excess sealant from surfaces while still uncured.
- .7 Installation of Acoustical Sealant: At sound-rated assemblies and elsewhere as indicated, seal construction at perimeters, behind control joints, and at openings and penetrations on both sides of assemblies with a continuous bead of acoustical sealant. Comply with ASTM C919 and with manufacturer's written recommendations.

3.4 Interior Joint Sealant Schedule

- .1 Interior vertical movement joints in interior concrete and unit masonry.
  - .1 UJS#1: Single-component non-sag urethane sealant.
- .2 Interior movement joints in interior unit masonry.
  - .1 UJS#1: Single-component non-sag urethane sealant.
- .3 Interior perimeter joints of exterior aluminum frames.
  - .1 UJS#1: Single-component non-sag urethane sealant.
- .4 Interior perimeter joints of interior frames.
  - .1 LJS#1: Siliconized acrylic latex
- .5 Interior sanitary joints between plumbing fixtures, food preparation fixtures, and casework and adjacent walls, floors, and counters.
  - .1 SJS#1: Mildew-Resistant, Single-Component, nonsag, acid-curing silicone joint sealant.
- .6 Interior non-moving joints between interior painted surfaces and adjacent materials.
  - .1 LJS#1: Siliconized acrylic latex
  - .2 Joint-Sealant Colour: Paintable.
- .7 Interior exposed and non-exposed acoustical applications.
  - .1 AJS#1: Acoustical joint sealant.

3.5 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

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## PART 1 GENERAL

### 1.1 General

- .1 Conform to the requirements of Division 1.

### 1.2 Related Sections

- .1 Section 06 10 00 Rough Carpentry
- .2 Section 07 92 00 Joint Sealants
- .3 Section 08 14 16 Flush Wood Doors
- .4 Section 08 71 10 Door Hardware
- .5 Section 08 88 13 Fire Resistant Glazing
- .6 Section 09 21 16 Gypsum Board
- .7 Section 09 22 16 Non-Structural Metal Framing
- .8 Section 09 91 23 Interior Painting

### 1.3 References

- .1 ASTM International (ASTM)
  - .1 ASTM A653/A653M-23 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
  - .2 ASTM C177-19e1 Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus
  - .3 ASTM C518-21 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
  - .4 ASTM D6386-22 Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting
  - .5 ASTM D7396-14(2020) Standard Guide for Preparation of New, Continuous Zinc-Coated (Galvanized) Steel Surfaces for Painting
  - .6 ASTM E90-09(2016) Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-1.181-99 Ready-Mixed Organic Zinc-Rich Coating.
- .3 CSA Group (CSA)
  - .1 CSA-G40.20-13/G40.21-13 General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
  - .2 CSA W59-18 Welded Steel Construction (Metal Arc Welding).
- .4 Canadian Steel Door Manufacturers' Association (CSDMA)
  - .1 CSDMA Recommended Dimensional Standards for Commercial Steel Doors and Frames, 2000
  - .2 CSDMA Recommended Specifications for Commercial Steel Doors and Frames, 2006.
  - .3 CSDMA Selection and Usage Guide for Commercial Steel Door and Frame Products, 2009.
- .5 Underwriters Laboratories Canada (ULC)
  - .1 ULC 104-2015 Standard Method for Fire Tests of Door Assemblies.
  - .2 ULC 105- 2016 Standard Specification for Fire Door Frames Meeting the Performance Required by CAN/ULC-S104.
  - .3 ULC 106-2015 Standard Method for Fire Tests of Window and Glass Block Assemblies
- .6 Underwriters Laboratories (UL)
  - .1 UL10B Fire Tests of Door Assemblies.
  - .2 UL10C Standard for Positive Pressure Fire Tests of Door Assemblies.
- .7 National Fire Protection Association (NFPA)

- .1 NFPA 80-22 Standard for Fire Doors and Other Opening Protectives.
- .2 NFPA 252-2017 Fire Tests of Door Assemblies.
- .8 American National Standards Institute (ANSI)
  - .1 ANSI 250.4-2018 Test Procedure and Acceptance Criteria for — Physical Endurance for Steel Doors, Frames and Frame Anchors
  - .2 ANSI 250.10-2011 Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames

#### 1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Provide shop drawings
  - .1 Indicate each type of door, frame, steel, construction and core.
  - .2 Indicate fire ratings.
  - .3 Indicate material thicknesses, mortises, reinforcements, anchorages, location of exposed fasteners, openings, arrangement of hardware, and finishes.
  - .4 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.

#### 1.5 Defining Opening Sizes

- .1 Width - Widths of openings shall be measured from inside to inside of frame jamb rabbets. (Referred to as "frame rabbet width" or "nominal door width")
- .2 Height - Heights of openings shall be measured from the finished floor (exclusive of floor coverings) to the head rabbet of the frame. (Referred to as "frame rabbet height" or "nominal door height")
- .3 Door Sizes - Doors shall be sized so as to fit the above openings and allow a 3 mm nominal clearance at jambs and head of frame. A clearance of 13 mm maximum shall be allowed between the bottom of the door and the finished floor (exclusive of floor coverings).
- .4 Tolerances - Doors and frame product shall be manufactured and installed in accordance with the CSDMA's, "Recommended Dimensional Standards for Commercial Steel Doors and Frames".

#### 1.6 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.

#### 1.7 Requirements of Regulatory Agencies

- .1 Steel fire rated doors and frames: labeled and installed by an organization accredited by Standards Council of Canada in conformance with ULC 104 or NFPA 252 for ratings specified or indicated.
- .2 Provide fire labeled frame products for those openings requiring fire protection ratings, as scheduled. Test products in strict conformance with ULC 104 or NFPA 252 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

## 1.8 Testing and Performance

- .1 Fire labeled products shall be provided for those openings requiring fire protection ratings as scheduled on the drawings. Products shall be tested in strict conformance with ULC 104 and listed by Underwriters Laboratory of Canada Ltd. or Warnock Hersey under an active Factory Inspection Program.
- .2 Product quality shall meet the standards established by the Canadian Steel Door Manufacturer's Association.
- .3 Door construction shall meet acceptance criteria of ANSI A250.10 and shall be certified as meeting Level A (1,000,000 cycles) and Twist Test Acceptance Criteria deflection not to exceed 6.4 mm/13.6 kg force, total deflection at 136.1 kg force not to exceed 64 mm and permanent deflection not to exceed 3.0 mm when tested in strict conformance with ANSI A250.4. Test shall be conducted by an independent nationally recognized accredited laboratory.
- .4 Core materials for insulated doors shall attain a thermal resistance rating of RSI 2.17 when tested in accordance with ASTM C177 or ASTM C518.

## 1.9 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

## PART 2 PRODUCTS

### 2.1 Materials

- .1 Steel doors and frame product manufactured in accordance with this Specification by CSDMA members, are eligible for use on this project.
- .2 Steel: Commercial grade steel to ASTM A653, CS, Type B, Coating Designation ZF75 (A25) minimum. Minimum steel thicknesses shall be in accordance with Appendix 1 of the CSDMA, Recommended Specifications for Commercial Steel Door and Frame Products unless noted otherwise.
- .3 Reinforcement channel: to CSA G40.20/G40.21, Type 44W, coating designation to ASTM A653, ZF75.
- .4 Door Core Materials
  - .1 Interior Doors: Structural small cell, 24.5mm maximum kraft paper 'honeycomb'. Weight 36.3 kg per ream minimum, density: 16.5 kg/m<sup>3</sup> minimum sanded to required thickness. ULC approved.
- .5 Primers:
  - .1 Touch-up prime CAN/CGSB-1.181, organic zinc rich, rust inhibitive.
  - .1 Maximum VOC limit 50 g/L to GC-03.

### 2.2 Adhesives

- .1 Adhesive: maximum VOC content 50 g/L to SCAQMD Rule 1168.
- .2 Honeycomb cores and steel components: heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement.

- .3 Polyisocyanurate: heat resistant, epoxy resin based, low viscosity, contact cement.
- .4 Lock-seam doors: fire resistant, resin reinforced polychloroprene, high viscosity, low VOC sealant/adhesive or U.L.C. approved equivalent.

## 2.3 Accessories

- .1 Glazing Stops: Minimum 0.9 mm base thickness sheet steel with wipe zinc finish to ASTM A525. Fasteners to be #6 x 32 mm cadmium plated oval head scrulox self-drilling type screws. Tamper proof screws.
- .2 Door silencers: single stud rubber/neoprene type.
- .3 Fiberglass: to ULC 702, loose batt type, minimum density of 24 kg/m<sup>3</sup>.
- .4 Metallic paste filler: to manufacturer's standard.
- .5 Sealant: As specified in Section 07 92 00.

## 2.4 Fabrication - Frame Products

- .1 General
  - .1 Fabricate frames in accordance with CSDMA specifications.
  - .2 Fabricate frames to profiles and maximum face sizes as indicated.
  - .3 Interior frame product shall be 1.60 mm. Interior frames, transoms, sidelights and window assemblies shall be welded type construction.
  - .4 Blank, reinforce, drill and tap frames for templated hardware and electronic hardware using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware.
  - .5 Prepare frames to receive electrical conduit for door operators where indicated and required.
  - .6 Protect mortised cutouts with steel guard boxes.
  - .7 Provide anchorage appropriate to floor, wall and frame construction. Each wall anchor shall be located immediately above or below each hinge reinforcement on the hinge jamb and directly opposite on the strike jamb. For rebate opening heights up to and including 1520 mm provide two (2) anchors, and an additional anchor for each additional 760 mm of height or fraction thereof, except as indicated below. Frames in previously placed concrete, masonry or structural steel shall be provided with anchors located not more than 150 mm from the top and bottom of each jamb, and intermediate anchors at 660 mm on centre maximum. Fasteners for such anchors shall be provided by others.
  - .8 Minimum reinforcing, anchor and other component thickness shall be in accordance with Table 1 of the CSDMA, "Recommended Specifications for Commercial Steel Door and Frame Products".
  - .9 Each interior door opening shall be prepared for single stud rubber door silencers, three (3) for single door openings, two for double door openings, except on gasketed frame product.
  - .10 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.
  - .11 Fire-rated frame products shall be provided for those openings requiring fire protection as determined and scheduled by the Consultant. Frames shall be listed for conformance with ULC 104. Window assemblies shall be listed for conformance with ULC 106. All fire-rated frame products shall bear the label of and be listed by a nationally recognized testing agency having a factory inspection service. Labeling shall be in accordance with NFPA 80, the listing authority's policies and label materials, and shall identify the manufacturer. Fire-rated frame products shall

be constructed as listed for labeling in the Follow-Up Service Procedures/Factory Inspection Manuals issued by the listing agency to individual manufacturers.

.2 Welded Type

- .1 Welding in accordance with CSA W59.
- .2 Accurately mitre or mechanically joint frame product and securely weld on inside of profile.
- .3 Grind welded joints and corners to a flat plane, fill with metallic paste and sand to uniform smooth finish.
- .4 Where frame product is to be installed prior to the adjacent partition, a floor anchor shall be securely attached to the inside of each jamb profile. Each floor anchor shall be provided with two holes for securing to the floor. For conditions that do not permit the use of a floor anchor, an additional wall anchor, located within 150 mm of the base of the jamb, shall be substituted.
- .5 Weld in two temporary jamb spreaders per door opening to maintain proper alignment during shipment and handling, which shall not be used for installation.
- .6 Glazing stops shall be formed steel channel, minimum 16 mm height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.
- .7 When required due to site access, when advised by the contractor responsible for coordination or installation, as specified on the drawings or due to shipping limitations, frame product for large openings shall be fabricated in sections as designated on the approved submittal drawings, with splice joints for field assembly and welding by others.
- .8 Prior to shipment, mark each frame product with an identification number as shown on the approved submittal drawings.
- .9 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.
- .10 Manufacturer's nameplates on frames and screens are not permitted

2.5 Fabrication - Doors

.1 General

- .1 Interior doors: insulated steel construction with honeycomb core laminated to minimum 1.19 mm nominal thickness steel face sheets under pressure.
  - .2 Voids between vertical stiffeners shall be filled with fiberglass batt type insulation.
  - .3 Doors: swing type, flush.
  - .4 Doors: manufacturers' proprietary construction, tested and/or engineered as part of a fully operable assembly, including door, frame, gasketing and hardware in accordance with ASTM E330.
- .2 Longitudinal edges shall be mechanically inter-locked, adhesive assisted. Seams: visible grind welded joints to a flat plane, fill with metallic paste filler and sand to a uniform smooth finish.
- .3 Doors shall be mortised, blanked, reinforced, drilled and tapped at the factory for templated hardware and electronic hardware, in accordance with the approved hardware schedule and templates provided by the hardware supplier.
- .4 Holes 12.7 mm diameter and larger shall be factory prepared, except mounting and through-bolt holes, which are by others, on site, at time of hardware installation. Holes less than 12.7 mm diameter shall be factory prepared only when required for the function of the device (for knob, lever, cylinder, thumb or turn pieces) or when these holes over-lap function holes.
- .5 Doors shall be reinforced where required, for surface mounted hardware, anchor hinges, thrust pivots, pivot reinforced hinges, or non-templated hardware.

- .6 Provide top and bottom of doors with inverted, recessed, welded steel channels.
- .7 Minimum reinforcing and component thickness shall be in accordance with Table 1 of the CSDMA, "Recommended Specifications for Commercial Steel Door and Frame Products".
- .8 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.
- .9 Prior to shipment, mark each door with an identification number as shown on the approved submittal drawings.
- .10 Manufacturer's nameplates on doors are not permitted.

**2.6**      Glazing Stops

- .1 Glazing stops shall be accurately fitted, butted at corners with removable stops located on push side of door.
- .2 Provide tamper proof screws on all doors and screens.

**2.7**      Finishes

- .1 Doors and frames shall wipe coat zinc, ready for painting.

**PART 3** EXECUTION

**3.1**      Manufacturer's Instructions

- .1 Comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheets.

**3.2**      Installation

- .1 Install doors and frames to CSDMA Installation Guide, NAAMM-HMMA 840, Installation Guide for Commercial Steel Doors and Frames.
- .2 Fire-rated door and frame product shall be installed in accordance with NFPA-80.
- .3 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 10 - Door Hardware. Coordinate with Section 08 71 10 for preparation and installation of automatic door operators.
- .4 Adjust operable parts for correct clearances and function.
- .5 Install glazing and door silencers.
- .6 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows:
  - .1 Hinge side: 1.0 mm.
  - .2 Latch side and head: 1.5 mm.
  - .3 Finished floor and thresholds: 13 mm.
- .7 Caulk perimeter of frames. Refer to Section 07 92 00 – Joint Sealants.

3.3 Finish Repairs

- .1 Touch up with primer finishes damaged during installation.
- .2 Fill exposed frame anchors and surfaces with imperfections with metallic paste filler and sand to a uniform smooth finish.

3.4 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

## PART 1 GENERAL

### 1.1 General

- .1 Conform to the requirements of Division 1.

### 1.2 Related Sections

- .1 Section 06 20 00 Finish Carpentry
- .2 Section 08 11 00 Metal Doors and Frames
- .3 Section 08 71 10 Door Hardware
- .4 Section 09 91 23 Interior Painting

### 1.3 References

- .1 ASTM International (ASTM)
  - .1 ASTM D1761-20 Standard Test Methods for Mechanical Fasteners in Wood and Wood-Based Materials
  - .2 ASTM D5456-21e1 Standard Specification for Evaluation of Structural Composite Lumber Products
  - .3 ASTM E90-09(2016) Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
  - .4 ASM E413-22 Classification for Rating Sound Insulation
  - .5 ASTM E2235-04(2020) Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods
- .2 American National Standards Institute (ANSI)
  - .1 ANSI A208.1 Standard for Particleboard.
- .3 CSA Group (CSA)
  - .1 CSA O115-M1982 (R2001) Hardwood and Decorative Plywood.
  - .2 CSA O132.2 Series-90 (R1998) Wood Flush Doors
- .4 Canadian General Services Board (CGSB)
  - .1 CAN/CGSB-71.19 Adhesive, Contact, Sprayable
  - .2 CAN/CGSB-71.20 Adhesive, Contact, Brushable
- .5 Architectural Woodwork Manufacturers Association of Canada (AWMAC): Quality Standards for Architectural Woodwork
- .6 Window and Door Manufacturer's Association (WDMA)
  - .1 ANSI/WDMA I.S. 1A-21 Interior Architectural Wood Flush Doors
- .7 South Coast Air Quality Management District (SCAQMD), California State
  - .1 SCAQMD Rule 1113-06 Architectural Coatings.
  - .2 SCAQMD Rule 1168-03 Adhesives and Sealants Applications.
- .8 Green Seal Environmental Standards
  - .1 Standard GS-11-97 Architectural Paints.

### 1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
  - .1 Submit manufacturer's printed product literature, specifications and data sheets for door materials and adhesives.
- .2 Submit shop drawings and door schedules.
  - .1 Indicate door types and cutouts for lights, sizes, core construction.

- .3 Submit samples.
  - .1 Submit one 300 x 300 mm corner sample of each type wood door.
  - .2 Show door construction, core, glazing detail and faces.
- .4 Manufacturer's Instructions:
  - .1 Submit manufacturer's installation instructions.

**1.5 Quality Assurance**

- .1 The "Quality Standards" of the Architectural Woodwork Manufacturers Association of Canada (AWMAC), 1991 Edition, together with authorized additions and amendments, shall be used as a reference standard and shall form part of this project specification.
- .2 Where modifications to the AWMAC Quality Standards contained within the Manual are included in this project specification, then such modifications shall govern in case of conflict.
- .3 Any reference to Custom or Premium grade in this specification shall be as defined in the AWMAC Quality Standards.
- .4 Any item not given a specific quality grade shall be Custom grade as defined in the AWMAC Quality Standards.
- .5 References in this specification to part and item numbers mean those parts and items contained within the AWMAC Quality Standards Manual.

**1.6 Shipping, Handling and Storage**

- .1 Refer to Section 01 16 00 – Common Product Requirements.
- .2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.
- .3 Wood door delivery, storage and handling shall be in accordance with Part 6, Item 3, of the AWMAC Quality Standards.
- .4 Do not deliver wood doors until the building and storage areas are sufficiently dry so that the wood doors will not be damaged by excessive changes in moisture content.
- .5 Delivered materials which are damaged in any way or do not comply with these specifications will be rejected by the Consultant and shall be removed from the job site and replaced with acceptable materials.

**1.7 Waste Management and Disposal**

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

**1.8 Warranty**

- .1 Warrant the work of this Section against defects of workmanship and material, for a period of two years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

## PART 2 PRODUCTS

### 2.1 Manufacturers

- .1 Acceptable Manufacturers: Member in good standing of the Architectural Woodwork Manufacturers Association of Canada (AWMAC) with minimum 5 years of production experience similar to this project, whose qualifications indicate ability to comply with requirements of this Section.

### 2.2 Materials

- .1 All door materials to conform to CSA O132.2.
- .2 Doors shall be constructed of solid laminated wood core with 3.0 mm thick Grade A face, book matched, flat cut maple, 50 mm stiles and 76 mm top and bottom rails. Stiles to be No. 3 maple edge.
- .3 Core shall consist of low density wood blocks, random lengths with staggered joints. All cores shall be drum sanded both sides. Particleboard cores are not acceptable.
- .4 Door thickness: as indicated.
- .5 Adhesive: To CSA 0132.2, Type II, water resistant, for interior use.

## PART 3 EXECUTION

### 3.1 Fabrication

- .1 Fabricate doors in accordance with CSA 0132.2.
- .2 Provide No. 3 vertical edge strips to match face veneer.
- .3 Bevel vertical edges of single acting doors 3.0 mm on lock side and 1.6 mm on hinge side.
- .4 Prepare doors for hardware.
- .5 Fabricate doors with reinforced openings for louvres, door grilles and glazed lites. Provide manufacturer's standard trim and stops.
- .6 Sand and prepare doors to receive clear urethane finish as indicated on the Room Finish and Door Schedules.

### 3.2 Installation

- .1 Unwrap and protect doors in accordance with CSA-O132.2 Series, Appendix A.
- .2 Install doors and hardware in accordance with manufacturer's printed instructions and CSA-0132.2 Series, Appendix A.
- .3 Install glazing in accordance with Section 08 80 05.
- .4 Adjust hardware for correct function.

.5 Doors to receive clear urethane finish as specified in Section 09 91 23.

3.3 Final Adjustment

.1 Re-adjust doors and hardware just prior to completion of building to function freely and properly

3.4 Cleaning

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

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## PART 1 GENERAL

### 1.1 General

- .1 Conform to the requirements of Division 1.

### 1.2 Related Sections

- .1 Section 06 20 00 Finish Carpentry
- .2 Section 08 11 00 Metal Doors and Frames
- .3 Section 08 14 16 Flush Wood Doors

### 1.3 References

- .1 American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA)
  - .1 ANSI/DHI A115.1G-1994 Installation Guide for Doors and Hardware
  - .2 ANSI/ICC A117.1-2017 Accessible and Usable Buildings and Facilities
  - .3 ANSI/BHMA A156.1-2013 American National Standard for Butts and Hinges.
  - .4 ANSI/BHMA A156.2-2011 Bored and Preassembled Locks and Latches.
  - .5 ANSI/BHMA A156.3-2014 Exit Devices.
  - .6 ANSI/BHMA A156.4-2013 Door Controls - Closers.
  - .7 ANSI/BHMA A156.5-2014 Auxiliary Locks and Associated Products.
  - .8 ANSI/BHMA A156.6-2010 Architectural Door Trim.
  - .9 ANSI/BHMA A156.8-2010 Door Controls - Overhead Stops and Holders.
  - .10 ANSI/BHMA A156.10-2011 Power Operated Pedestrian Doors.
  - .11 ANSI/BHMA A156.12-2013 Interconnected Locks and Latches.
  - .12 ANSI/BHMA A156.13-2012 Mortise Locks and Latches Series 1000.
  - .13 ANSI/BHMA A156.15-2011 Release Devices - Closer Holder, Electromagnetic and Electromechanical.
  - .14 ANSI/BHMA A156.18-2012 Materials and Finishes.
  - .15 ANSI/BHMA A156.19-2013 Power Assist and Low Energy Power - Operated Doors.
- .2 Canadian Steel Door Manufacturers' Association (CSDMA)
  - .1 CSDMA Canadian Metric Guide for Steel Doors and Frames (Modular Construction): Standard Hardware Location Dimensions.
- .3 National Wood Window and Door Association (NWWDA)
- .4 Door Hardware Institute (DHI)
- .5 Accessibility for Ontarians with Disabilities Act (AODA)

### 1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Product Data: Submit manufacturer's printed product literature, specifications and data sheets.
- .3 Samples:
  - .1 Identify each sample by label indicating applicable specification paragraph number, brand name and number, finish and hardware package number.
  - .2 After approval samples will be returned for incorporation in the Work.
- .4 Hardware List:
  - .1 Submit contract hardware list.
  - .2 Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.

- .5 Manufacturer's Instructions: Submit manufacturer's installation instructions.
- .6 Provide operation and maintenance data for door closers, locksets, door holders, electrified hardware and fire exit hardware for incorporation into Operations and Maintenance Manuals specified in Section 01 78 00 - Closeout Submittals.

1.5 Quality Assurance

- .1 Regulatory Requirements:
  - .1 Hardware for doors in fire separations and exit doors certified by a Canadian Certification Organization accredited by Standards Council of Canada.
  - .2 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
  - .3 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .2 Pre-installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.6 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.
- .3 Package each item of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.
- .4 Receive the delivery of the Finishing Hardware and identify all items against the Finishing Hardware Schedule. Ensure each hardware item is accompanied by the correct template, installation instructions, special tools, fastening devices and other loose items. Advise the finish hardware supplier and Consultant in writing of errors or omissions.
- .5 Storage and Protection: Store finishing hardware in locked, clean and dry area.
- .6 Remove all hardware from doors and frames prior to painting. After painting is complete and dry, reinstall all hardware to manufacturer's recommendations.

1.7 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

1.8 Warranty

- .1 Warrant all hardware against defects of workmanship and material, for a period of one year, except for door closers which shall be warranted for ten years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

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## PART 2 PRODUCTS

### 2.1 Materials

- .1 All hardware shall be supplied as specified in the Finishing Hardware Schedule.
- .2 All finishes shall be as indicated in the Finishing Hardware Schedule by international codes.
- .3 All door handles shall be lever type meeting requirements of the referenced accessibility standards and the Ontario Building Code.
- .4 Power Door Operators and controls shall be CSA approved and shall meet the requirements of the Ontario Building Code and the Accessibility for Ontarians with Disabilities Act (AODA).

### 2.2 Fastenings

- .1 Use only fasteners provided by manufacturer. Failure to comply may void warranties and applicable licensed labels.
- .2 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.
- .3 Exposed fastening devices to match finish of hardware.
- .4 Where pull is scheduled on one side of door and push plate on other side, supply fastening devices, and install so pull can be secured through door from reverse side. Install push plate to cover fasteners.
- .5 Use fasteners compatible with material through which they pass.

### 2.3 Electrified Devices

- .1 Electrified exit devices shall conform to all traditional exit device standards as specified above. All power requirements for exit devices used must utilize a continuous circuit electric hinge for clean design and no visible means of interrupting power to device.
- .2 All exit devices with electric latch retraction shall provide for a remote means of unlocking for momentary or maintained periods of time.
- .3 Exit devices with electrified trim shall be fail-secure unless otherwise specified.

### 2.4 Keying

- .1 Keying: All permanent cylinders to be grandmaster-keyed as directed by the Owner. The factory shall key all locks and cylinders and maintain keying records. The factory shall establish a System Information Document (SID) to designate primary system administrators and require a separate letter of authorization for all future shipments of keyed products.
- .2 Remove all construction cores and install all permanent cores. Unless otherwise directed by the Owner.
- .3 Construction master/change keys are to be delivered by the contractor directly to The Owner.

- .4 Ship all permanent cylinders and keys separately. Identify door number and keyset symbol on each envelope for direct factory delivery to the owner.

### PART 3 EXECUTION

#### 3.1 Manufacturer's Instructions

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- .2 Furnish metal door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.
- .3 Furnish manufacturers' instructions for proper installation of each hardware component.

#### 3.2 Examination

- .1 Before installing any hardware, carefully check all architectural drawings of the work requiring hardware, verify door swings, door and frame materials and operating conditions, and assure that all hardware will fit the work to which it is to be attached.
- .2 Check all shop drawings and frame and door lists affecting hardware type and installation, and certify to the correctness thereof, or advise the hardware supplier and Consultant in writing of required revisions.

#### 3.3 Templates

- .1 Check the hardware schedule, drawings and specifications, and furnish promptly to the applicable trades any patterns, templates, template information and manufacturer's literature required for the proper preparation for and application of hardware, in ample time to facilitate the progress of the work.

#### 3.4 Installation

- .1 Installation of hardware shall be in accordance with ANSI A115.1G, manufacturer's templates and instructions.
- .2 Install each item of mechanical and electromechanical hardware and access control equipment to comply with the manufacturer's written instructions and according to specifications. All items to be installed with fasteners identified by manufacturer's installation instructions unless otherwise noted.
- .3 Mounting Heights: Install door hardware at heights indicated in the following applicable publications unless; specifically indicated or required by local governing regulations, requirements to match for special templates, necessary coordination with door elevations, and or to ensure consistency with pairs of doors.
  - .1 DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames"
  - .2 DHI's "Recommended Locations for Architectural Hardware for Wood Flush Doors"
  - .3 ANSI/ICC A117.1 Accessibility Guidelines for Buildings and Facilities
  - .4 NWWDA
  - .5 AODA

- .4 Power door operator products and accessories are required to be installed by an AAADM certified technician as approved by the manufacturer. Adjust for proper opening and closing operation after final balancing of HVAC system.
- .5 Coordinate installation of electric door strikes, keypad locks, card readers, washroom duress systems, and other electronic door control and security devices with Electrical contractor including supply and installation of wiring and all terminations.
- .6 All hardware shall be installed by carpenters, skilled in the application of architectural hardware and satisfactory to the hardware supplier. Refer to Section 06 20 00 - Finish Carpentry. Instruction sheets, details and templates shall be read and understood before installation.
- .7 Install all materials as listed in the Finishing Hardware Schedule on the doors and frames listed. Interchanging of hardware will not be allowed.
- .8 Use only manufacturer's supplied fasteners. Failure to comply may void manufacturer's warranties and applicable licensed labels. Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.
- .9 Where door stop contacts door pulls, mount stop to strike bottom of pull.
- .10 Remove construction cores when directed by Owner's Representative.
- .11 After installation, templates, installation instructions and details shall be put in a file and turned over to the Owner, when building is Substantially Performed.

### 3.5 Field Quality Control

- .1 Conduct periodic inspections to ensure that door frames are installed plumb, level and square with verification by installer prior to installation of doors and door hardware.
- .2 Hardware supplier to attend site meetings as required to ensure proper execution of the guidelines set forth herein.
- .3 Hardware supplier will perform final field inspection of installed door hardware after final adjustment of all products and will document and report any deficiencies or omissions for correction and written acceptance by the Contractor.

### 3.6 Adjusting

- .1 Adjust door hardware, operators, closers and controls for optimum, smooth operating condition, safety and for weather tight closure.
- .2 Lubricate hardware, operating equipment and other moving parts.
- .3 Adjust door hardware to provide tight fit at contact points with frames.

### 3.7 Demonstration

- .1 Instruct Owner's maintenance personnel in the proper adjustment, operation and maintenance of mechanical and electromechanical door hardware, electronic devices and maintenance of finishes.

3.8 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.
- .2 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .3 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacturer's instructions.
- .4 Remove protective material from hardware items where present.

End of Section

CONSULTANT : **KEVIN WILBUR**  
CONTRACT # :

REV.#1:



# **RIVETT ARCHITECTURAL HARDWARE LTD.**

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## **FINISHING HARDWARE SCHEDULE** **FOR**

**PETERBOROUGH CITY HALL  
GROUND FLOOR RENOVATIONS  
500 GEORGE ST. NORTH  
PETERBOROUGH, ONTARIO**

**ARCHITECT/ENGINEER/CONSULTANT**

**BBA**

**CUSTOMER :**

**SUBMITTED BY :**

	<b>RIVETT ARCHITECTURAL HARDWARE LTD.</b> 111 INDUSTRIAL DR., WHITBY, ONTARIO CANADA L1N 5Z9 TEL-905-668-4455 FAX-905-668-4433
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**kevin@rivett.com**  
**OVER FORTY-SIX YEARS OF EXCELLENCE**

## HARDWARE INFORMATION AND SPECIFICATIONS

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March 13, 2024

**FINISH:** ALL FINISHES SHALL BE AS INDICATED IN THE FINISHING HARDWARE SCHEDULE BY INTERNATIONAL CODES.

**KEYING:** FINAL KEYING BY OWNER

**INSTALLATION:** ALL HARDWARE SHALL BE INSTALLED AND ADJUSTED COMPLETE AS PER THE MANUFACTURERS PRINTED INSTRUCTIONS AND TEMPLATES, BY SKILLED CARPENTERS IN THE APPLICATION OF FINISHING HARDWARE.

**PRODUCTS:** MANUFACTURER'S PRODUCTS SHALL ALL BE AS SPECIFIED. ANY EQUALS MUST BE APPROVED IN WRITING AND ONLY IF THEY ARE EQUAL IN DESIGN, FUNCTION, QUALITY, AND FINISH AS LISTED IN SCHEDULE

HINGES BY HAGER  
LOCKS BY SCHLAGE  
CLOSERS BY LCN

TRIM HARDWARE BY HAGER  
SEALS BY K.N. CROWDER  
PDO'S BY BEASAM CANADA  
ELECTRIC STRIKES BY HES

**HANDLING:** WHERE DOORS AND FRAMES ARE TO BE FIELD PAINTED OR FINISHED, ALL HARDWARE SHALL BE REMOVED BY THE GENERAL CONTRACTOR, PRIOR TO SAME. AFTER FINISHING HAS BEEN COMPLETED, THE GENERAL CONTRACTOR SHALL RE-INSTALL ALL THE HARDWARE TO MANUFACTURERS RECOMMENDATIONS.

**PACKING:** LABEL ALL FINISHING HARDWARE WITH DOOR NUMBERS AND ITEM NUMBERS. THE GENERAL CONTRACTOR SHALL RECEIVE IN A LOCKED DRY STORAGE AREA AND ADVISE WITHIN 24 HOURS OF ANY SHORTAGES.

**SUBMITTAL:** BEFORE MATERIAL IS ORDERED, SUBMIT (1) ONE COPY OF THE COMPLETED HARDWARE SCHEDULE FOR FINAL APPROVAL. SUPPLY ALL NECESSARY TEMPLATES REQUIRED FOR FABRICATION.

**WARRANTY:** THE WARRANTY PERIOD SHALL BE ONE (1) YEAR GENERALLY AND TEN (10) YEARS FOR DOOR CLOSERS, THIS SHALL BE SENT TO THE GENERAL CONTRACTOR ON COMPLETION.

**OMISSIONS:** ANY ITEMS OF FINISHING HARDWARE REQUIRED FOR THIS PROJECT AND NOT INCLUDED IN THIS SPECIFICATION AND/OR SCHEDULE WILL BE ADDED TO THE CONTRACT AFTER AN APPROVED CHANGE NOTICE HAS BEEN ISSUED BY THE ARCHITECT.

**QUALITY:** PERSONNEL WHO WILL BE RESPONSIBLE FOR SCHEDULING, ORDERING AND CO-ORDINATION HARDWARE FOR THIS PROJECT SHALL BE AN EXPERIENCED HARDWARE CONSULTANT AND WITH AN EXPERIENCED HARDWARE DISTRIBUTOR BOTH OF WHICH SHALL HAVE A MINIMUM OF FIVE YEARS EXPERIENCE. THE ARCHITECT MAY REQUEST A QUALIFICATION FORM SUBMITTED.

# SYMBOLS

RIVETT ARCHITECTURAL HARDWARE LTD.

March 13, 2024

## FINISHES

B.H.M.A.	CANADIAN	U.S.A.	DESCRIPTION
600	CP	USP	PRIMED FOR PAINT
602	C2C	US2C	CADMIUM PLATED
603	C2G	US2G	ZINC PLATED
605	C3	US3	BRIGHT BRASS CLEAR COATED
606	C4	US4	SATIN BRASS CLEAR COATED
609	C5	US5	SATIN BRASS BLACKENED CLEAR COAT
612	C10	US10	SATIN BRONZE CLEAR COATED
613	C10B	US10B	OXIDIZED SATIN BRONZE OIL RUBBED
619	C15	US15	SATIN NICKEL PLATED CLEAR COATED
625	C26	US26	BRIGHT CHROMIUM PLATED
626	C26D	US26D	SATIN CHROMIUM PLATED
627	C27	US27	SATIN ALUMINUM CLEAR COATED
628	C28	US28	SATIN ALUMINUM CLEAR ANODIZED
629	C32	US32	BRIGHT STAINLESS STEEL
630	C32D	US32D	SATIN STAINLESS STEEL
689	SBL	USP28	ALUMINUM PAINT
690	DBL	USP20	DARK BRONZE PAINT
691	ES, SB		BRONZE LACQUER
692	TAN		TAN LACQUER
693	KPD, BLACK		BLACK LACQUER
696	EAB, SB		SATIN BRASS LACQUER

## HANDING

LH	LEFT HAND	LHA	LEFT HAND ACTIVE
RH	RIGHT HAND	RHA	RIGHT HAND ACTIVE
LHR	LEFT HAND REVERSE	LHRA	LEFT HAND REVERSE ACTIVE
RHR	RIGHT HAND REVERSE	RHRA	RIGHT HAND REVERSE ACTIVE

## WORDS

ALUM	ALUMINUM	NRP	NON REMOVABLE PIN
ASA	ASA STRIKE	PR	PAIR
BS	BACKSET	SEC	SECTION
CC	CANCELED	SGLE	SINGLE
CYL	CYLINDER	STD	STANDARD
DA	DOUBLE ACTING	TB	THRU BOLTS
DS	DEAD STOP	ULA	UNDERWRITERS LABELED 3 HOUR RATED
EA	EACH	ULB	UNDERWRITERS LABELED 1 1/2 HOUR RATED
ELEV	ELEVATION	ULC	UNDERWRITERS LABELED 3/4 HOUR RATED
HDWE	HARDWARE	ULD	UNDERWRITERS LABELED 1/3 HOUR RATED
HO	HOLD OPEN	UL	UNDERWRITERS FIRE LABELED
MM	MILLIMETERS	161	STANDARD CYLINDER LOCK CUTOOT

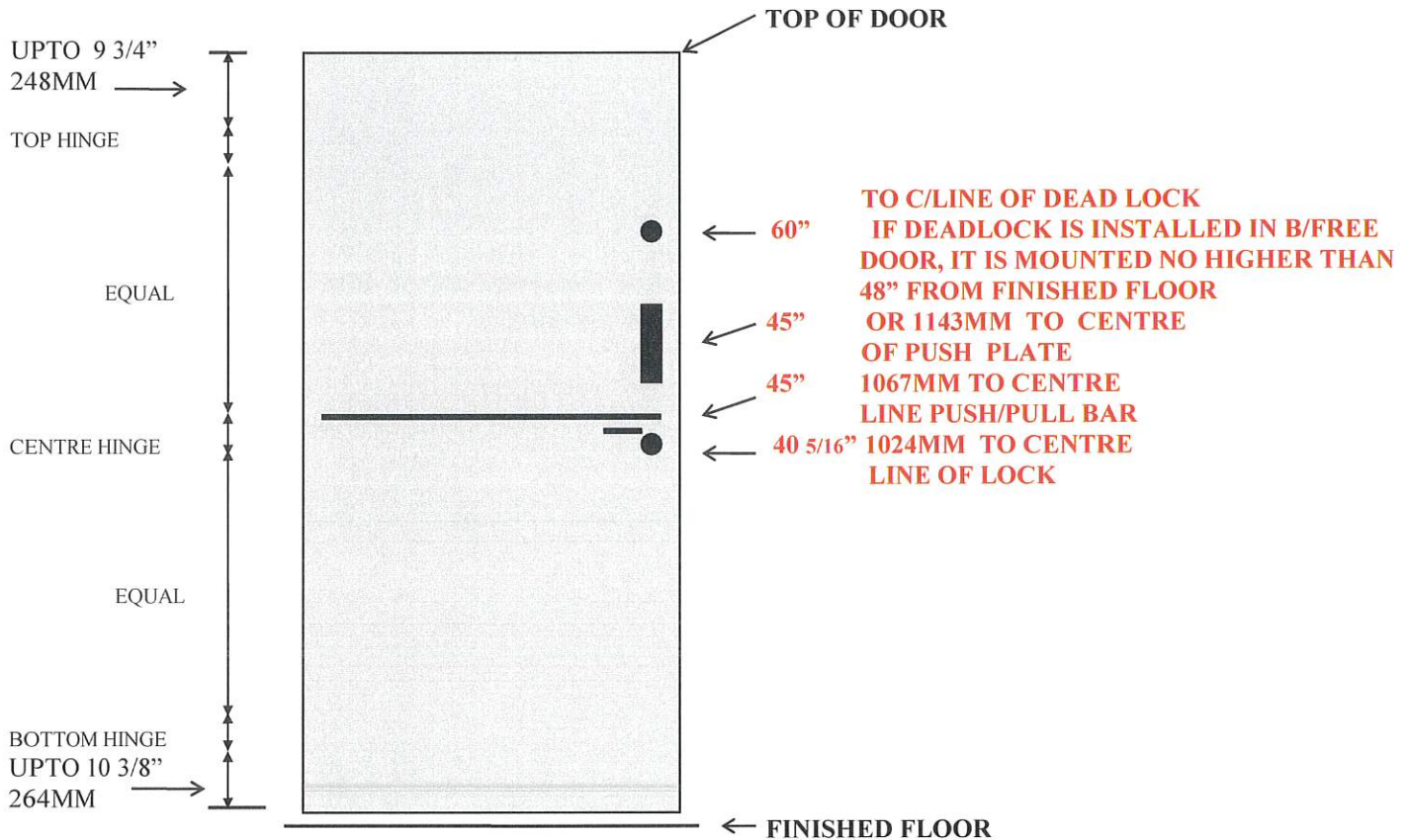
## DOORS & FRAMES

FS	FRAME SINGLE "KD"	FD	FRAME DOUBLE "KD"
FSW	FRAME SINGLE WELDED	FDW	FRAME DOUBLE WELDED
FSWTH	FRAME SINGLE WELDED THERMO	FDWTB	FRAME DOUBLE WELDED THERMO
FSTB	FRAME SINGLE THERMO "KD"	FDWDE	FRAME WELDED DOUBLE EGRESS
FSDW	FRAME SINGLE DRYWALL	FDWCS	FRAME WELDED CONTRA SWING
FSDWW	FRAME SGLE DRYWALL WELDED	FDDW	FRAME DOUBLE DRYWALL "KD"
D	DOOR "D" SERIES HONEYCOMB CORE	-14	14 GAUGE STEEL DOOR OR FRAME
H	DOOR "H" SERIES STEEL STIFFENED	-16	16 GAUGE STEEL DOOR OR FRAME
E	DOOR "E" SERIES EMBOSSED	-18	18 GAUGE STEEL DOOR OR FRAME
		-20	20 GAUGE STEEL DOOR OR FRAME
M	FLUSH FACE DOOR	PSF	PRESSED STEEL FRAME
G	HALF LITED DOOR	WF	WOOD FRAME
NL	NARROW LITED DOOR	HMD	HOLLOW METAL DOOR
L	LOUVERED DOOR	HCWD	HOLLOW CORE WOOD DOOR
2G	TWO LITED DOOR	SCWD	SOLID CORE WOOD DOOR
V	VIEW LITED DOOR	PLAM	PLASTIC LAMINATED DOOR
KD	KNOCK DOWN	PSF	PRESSED STEEL FRAME
TRR	TEMPERATURE RISE RATED	CIF	CHANNEL IRON FRAME
STC	SOUND TRANSMISSION	DR	DOOR

# HARDWARE LOCATION DIAGRAM

RIVETT ARCHITECTURAL HARDWARE LTD.

March 13, 2024



ALL HARDWARE MOUNTING LOCATIONS SHALL BE AS PER LOCATIONS DIAGRAM AND HELD CONSISTENT THROUGHOUT THE PROJECT, UNLESS INDICATED ELSEWHERE IN THE ARCHITECTS DRAWINGS, FINISHING HARDWARE SCHEDULE OR AS DIRECTED BY

**GENERAL CONTRACTOR TO VERIFY BLOCKING IS INSTALLED IN DRYWALL STUD PARTITIONS WHERE WALL STOPS ARE SPECIFIED**

**Rivett Architectural Hardware Ltd.**

**Door Listing**

**PETERBOROUGH CITY HALL - PETERBOROUGH, ONT**

**Schedule 91045**  
**Date Mar 13-24**

<b>Door Number</b>	<b>Set Number</b>
102	1
114B	7
114C	7
119	4
C03A	5
C03B	6

**Rivett Architectural Hardware Ltd.**  
**Hardware Schedule**  
**PETERBOROUGH CITY HALL - PETERBOROUGH, ONT**

**Schedule 91045**  
**Date Mar 13-24**

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**Set # 1**

1 SINGLE DR # 102 CORRIDOR 003A TO EXIST KITCHENETTE 102 RH

1 - 3'-2" x 7'-0" x 1-3/4" x HMD x PSF

---

**Qty**

:	:	3 EA	HINGE	BB1279-114 X 101- 613
:	:	1 EA	LATCHSET	ALX10S X SAT X ASA X 613
:	:	1 EA	FLOOR STOP	243F X 613

---

**Set # 2**

1 SINGLE DR # 107 TO EXIST OFFICE 107 SLIDING

1 SINGLE DR # 109 TO EXIST OFFICE 109 SLIDING

1 SINGLE DR # 111 TO EXIST OFFICE 111 SLIDING

1 SINGLE DR # 113 TO EXIST OFFICE 113 SLIDING

4 - 8'-10" x 7'-10" x 1-3/4" x SLIDING ALUMINUM DOOR

all hardware by aluminum door supplier

---

**Set # 3**

1 SINGLE DR # 110 EXIST CORR C04 TO MEETING RM 110 LH

1 - 3'-2" x 7'-10" x 1-3/4" x ALD x ALF

all hardware by aluminum door supplier

---

**Set # 4**

1 SINGLE DR # 119 EXIST CORR C05 TO OFFICE 119 RH

1 - 3'-2" x 7'-0" x 1-3/4" x SCWD x PSF

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**Qty**

:	:	3 EA	HINGE	BB1168-114 X 101-613
:	:	1 EA	OFFICE LOCKSET	ALX53PD X SAT X ASA X 613
:	:	1 EA	FLOOR STOP	243F X 613

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**Rivett Architectural Hardware Ltd.**  
**Hardware Schedule**  
**PETERBOROUGH CITY HALL - PETERBOROUGH, ONT**

**Schedule 91045**  
**Date Mar 13-24**

**Set # 5**

1 SINGLE DR # C03A EXIST CORR C03 TO RAMP 1 R1

RH

1 - 3'-2" x 7'-0" x 1-3/4" x SCWD x PSF

**Qty**

:	:	3 EA	HINGE	BB1168-114 X 101-613
:	:	1 EA	STOREROOM LOCKSET	ALX80PD X SAT X ASA X 613
:	:	1 EA	ELECTRIC STRIKE	1600CLB X 630
			low voltage wiring to strike by EC	
:	:	1 EA	DOOR OPERATOR	SW200i X SINGLE HSG X 613
			110v to head of frame by EC	
:	:	1 EA	DOOR OPERATOR ADD ON	SW200i ADD FOR INSWING ARM
:	:	1 EA	CARD READER	BY SECURITY
			low voltage wiring and single gang junction box by EC	
:	:	2 EA	WALL MOUNT SWITCH	#6R-3 X H/C PUSH X 630
			single gang junction boxes and low voltage wiring to push buttons by EC	
:	:	1 EA	LABOUR CHARGE	LABOUR - INSTALL OPER. & E/ST
:	:	2 EA	KICKPLATE	190S X 152 X 914 X 613
:	:	1 EA	FLOOR STOP	243F X 613

**Rivett Architectural Hardware Ltd.**  
**Hardware Schedule**  
**PETERBOROUGH CITY HALL - PETERBOROUGH, ONT**

**Schedule 91045**  
**Date Mar 13-24**

**Set # 6**

1 SINGLE DR # C03B EXIST CORR C04 FROM EXIST CORR C03

RHR

1 - 3'-2" x 7'-0" x 1-3/4" x HMD x SC04/PSF x 45min  
is this door meant to be locked when it does shut?

**Qty**

:	:	3 EA	HINGE	BB1168-114 X 101-613
:	:	1 EA	PANIC DEVICE	98L-F X 996L X RHR X 613
:	:	1 EA	RIM CYL.	20-021 X 613
:	:	1 EA	ELECTRIC STRIKE	9500 X UL X 630
			low voltage wiring to strike by EC	
:	:	1 EA	DOOR OPERATOR	SW200i X SINGLE HSG X 613
			110v to head of frame by EC	
:	:	2 EA	KICKPLATE	190S X 152 X 914 X 613
			install on both sides of door	
:	:	1 EA	ELECTROMAGNETIC DOOR RELEASE	SEM7830 X DARK BRONZE
			low voltage wiring to floor magnets by EC	
:	:	2 EA	WALL MOUNT SWITCH	#6R-3 X H/C PUSH X 630
			single gang junction boxes and low voltage wiring to push buttons by EC	
:	:	1 EA	LABOUR CHARGE	LABOUR - INSTALL OPER. & E/ST

**Set # 7**

1 SINGLE DR # 114B EXIST TAX OFFICE 114A TO OFFICE 114B

RH

1 SINGLE DR # 114C EXIST TAX OFFICE 114A TO OFFICE 114C

LH

2 - 3'-2" x 7'-0" x 1-3/4" x SCWD x PSF

**Qty**

:	:	6 EA	HINGE	BB1168-114 X 101-613
:	:	2 EA	OFFICE LOCKSET	ALX53PD X SAT X ASA X 613
:	:	2 EA	FLOOR STOP	243F X 613

---

## PART 1 GENERAL

### 1.1 General

- .1 Conform to the requirements of Division 1.

### 1.2 Related Sections

- .1 Section 07 92 00 Joint Sealants
- .2 Section 08 11 00 Metal Doors and Frames
- .3 Section 08 87 20 Decorative Window Films
- .4 Section 08 88 13 Fire Resistant Glazing

### 1.3 References

- .1 ASTM International (ASTM)
  - .1 ASTM C162-05 (2015) Standard Terminology of Glass and Glass Products.
  - .2 ASTM C542-05(2017) Standard Specification for Lock-Strip Gaskets
  - .3 ASTM C1048-18 Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass
  - .4 ASTM C1135-19 Standard Test Method for Determining Tensile Adhesion Properties of Structural Sealants
  - .5 ASTM C1184-18e1 Standard Specification for Structural Silicone Sealants
  - .6 ASTM C1376-15 Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass
  - .7 ASTM D790-17 Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
  - .8 ASTM D1929-20 Standard Test Method for Determining Ignition Temperature of Plastics
  - .9 ASTM D2240-15e1 Standard Test Method for Rubber Property—Durometer Hardness
  - .10 ASTM E84-23d Standard Test Method for Surface Burning Characteristics of Building Materials
  - .11 ASTM E1300-16 Standard Practice for Determining Load Resistance of Glass in Buildings
- .2 American National Standards Institute (ANSI).
  - .1 ANSI Z97.1 American National Standard for Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test.
- .3 American Architectural Manufacturer's Association (AAMA)
  - .1 AAMA SSGPG-1 Structural Silicone Glazing (SSG) Design Guidelines.
- .4 National Fire Protection Association
  - .1 NFPA 80 Standard for Fire Doors, Fire Windows.
- .5 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-12.1-17 Safety Glazing
  - .2 CAN/CGSB-12.8-17 Insulating Glass Units
- .6 Consumer Product Safety Commission
  - .1 CPSC 16 CFR 1201 Safety Standard for Architectural Glazing Materials.
- .7 Environmental Choice Program (ECP).
  - .1 CCD-045-95 Sealants and Caulking.
- .8 Flat Glass Manufacturers Association (FGMA).
  - .1 FGMA Glazing Manual - 1997.
- .9 Glass Association of North America (GANA)
  - .1 GANA Glazing Manual 50th Anniversary Edition-2008.
  - .2 GANA Laminated Glazing Reference Manual - 2009.
  - .3 GANA Sealant Manual-2008.
  - .4 GANA Guide to Architectural Glass (2010).
  - .5 GANA/PGC International Protective Glazing Manual (2010).
- .10 South Coast Air Quality Management District, California State (SCAQMD)

.1 SCAQMD Rule 1168-03, Adhesives and Sealants Applications.

#### 1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Shop Drawings:
  - .1 Structural Silicone Glazing (SSG): Submit glazing details for all glazing requiring structural silicone joints to silicone manufacturer for approval and recommendations. Include glazing methods and procedures.
- .3 Product Data: Submit manufacturer's printed product literature, specifications and data sheets.
- .4 Certificates: submit product certificates signed by manufacturer certifying materials and assemblies comply with specified performance characteristics and criteria and physical requirements.
- .5 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .6 Samples: Submit duplicate 300 x 300 mm size samples of glass and sealant material.
- .7 Manufacturer's Instructions: Submit manufacturer's installation instructions.
- .8 Provide maintenance data for glazing for incorporation into Operation and Maintenance Manual specified in Section 01 78 00 – Closeout Submittals.

#### 1.5 Quality Assurance

- .1 Perform work in accordance with FGMA Glazing Manual and Laminators Safety Glass Association Standards Manual for glazing installation methods.
- .2 Installer: Company specializing in the installation of structural glazing with five years proven experience and approved by the manufacturer for installation of their products.
- .3 Safety glass products shall comply with the testing requirements of CAN/CGSB-12.1, Type 1 for Laminated Glass and Type 2 for Tempered Glass.
- .4 Provide safety glass permanently marked with the company name or logo and CAN/CGSB-12.1 if the product meets categories 1 and 2, or mark as CAN/CGSB 12.1M-1 if the product meets the requirements of Category 1 only.
- .5 Comply with published recommendations of glass product manufacturers and organizations below, except where more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this section or referenced standards.
  - .1 GANA Publications
  - .2 AAMA Publications
  - .3 IGMA/IGMAC Publications
- .6 Single-source fabrication responsibility: All glass fabricated for each type shall be processed and supplied by a single fabricator.
- .7 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

- .8 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

#### 1.6 Design Requirements

- .1 Limit glass deflection to 1/200 with full recovery of glazing materials.
- .2 Glass thicknesses indicated are minimum and are for detailing only. Confirm glass thickness by analyzing project conditions, including in-service conditions and loads. Coordinate glass thicknesses with manufacturers of framing systems.
- .3 Design of structural glass (SSG) lites shall be prepared, certified, signed and sealed by a Structural engineer registered in the Province of Ontario.

#### 1.7 Project Conditions

- .1 Install glazing when ambient temperature is 10 ° C minimum. Maintain ventilated environment for 24 hours after application.
- .2 Maintain minimum ambient temperature before, during and for 24 hours after installation of glazing compounds.

#### 1.8 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.
- .3 Provide glass units with interleaving protection between lites. Keep glass and interleaving dry and store cases in clean, cool, dry areas with temperatures above the dew point. Circulation of cool, dry air in storage areas is essential. Open cases and inspect units periodically for moisture accumulation.
- .4 Do not store glass in direct sunlight without an opaque protective covering over same.

#### 1.9 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

### PART 2 PRODUCTS

#### 2.1 Materials-Flat Glass

- .1 Tempered Safety Glass: To CAN/CGSB-12.1, transparent, thickness as indicated. Type 2-tempered.
  - .1 Class B-float.
  - .2 Category 1
  - .3 Edge treatment: ground, bevel edge.

#### 2.2 Fire Rated Glass

- .1 Refer to Section 08 88 13

## 2.1 Glazing Products

- .1 Select appropriate glazing sealants, tapes, gaskets and other glazing materials of proven compatibility with other materials that they contact. These include glass products, insulating glass unit seals and glazing channel substrates under installation and service conditions, as demonstrated by testing and field experience.
- .2 Setting blocks: Neoprene 80-90 Shore A durometer hardness to ASTM D2240, to suit glazing method, glass light weight and area.
- .3 Spacer shims: Neoprene 50-60 Shore A durometer hardness to ASTM D2240, 75 mm long x one half height of glazing stop x thickness to suit application. Self-adhesive on one face.
- .4 Glazing tape:
  - .1 Preformed butyl compound with integral resilient tube spacing device, 10-15 Shore A durometer hardness to ASTM D 2240; coiled on release paper; black colour.
  - .2 Closed cell polyvinyl chloride foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume 2%, designed for compression of 25%, to effect an air and vapour seal.
- .5 Glazing splines: resilient polyvinyl chloride, extruded shape to suit glazing channel retaining slot, colour as selected.
- .6 Lock-strip gaskets: to ASTM C542.
- .7 Glazing Gaskets: To ASTM C864.
- .8 Sealant: as specified in Section 07 92 00 – Joint Sealants. Low VOC.
- .9 Structural Silicone Sealant: To ASTM C920 and ASTM C1184, for glass to glass or glass to metal contact: One component, silicone based sealant, CGE Ultraglaze SSG-4000, Dow 795 or 999-A, or General Electric Gesil N 2600", SCS 100 or SCS 1200, or Guardian Silicone Structural Glazing Sealants or equal, as per manufacturer's recommendations for the particular condition of use. Colour to be "crystal clear".
- .10 Glass Channels: CR Laurence Model UCBS3812SL U channel frames with top load gasket. Channel size 45 mm x 43 mm. Brushed stainless steel finish.

## PART 3 EXECUTION

### 3.1 Manufacturer's Instructions

- .1 Compliance: Comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

### 3.2 Examination

- .1 Verify that openings for glazing are correctly sized and within tolerance.
- .2 Verify that surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.

### 3.3 Preparation

- .1 Clean contact surfaces with solvent and wipe dry.
- .2 Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- .3 Prime surfaces scheduled to receive sealant.

3.4 Installation – General

- .1 Perform work in accordance with GANA Glazing Manual for glazing installation methods.

3.5 Installation: Interior - Dry Method

- .1 Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing, maximum 9 mm below sight line.
- .2 Apply cap bead of sealant along void between stop and glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.
- .3 Cut glazing tape to length and set against permanent stops, projecting 1.6 mm above sight line.
- .4 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.
- .5 Rest glazing on setting blocks and push against tape for full contact at perimeter of light or unit.
- .6 Place glazing tape on free perimeter of glazing.
- .7 Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
- .8 Knife trim protruding tape.
- .9 Glaze hollow metal doors and pressed steel screens. Glass type as indicated.

3.6 Installation SSG Glazing

- .1 SSG Glazing shall be completed in accordance with manufacturer's instructions, shop drawings, GANA Glazing Manual and AAMA SSGPG-1.
- .2 Joint surfaces must be clean, dry, dust free, and frost free. Surfaces must be cleaned with a solvent before the sealant is applied.
- .3 Prime clean surfaces.
- .4 Set glass or panel in place according to standard practice. Install spacers and backers as recommended by the manufacturer and in accordance with shop drawings.

3.7 Reception Screens

- .1 Install reception screens with continuous top and bottom glass channels, and seamless SSG joints as indicated.
- .2 Prepare glass and install speak throughs where indicated. Coordinate installation with electrical.

3.8 Vision Strips

- .1 Where indicated or where required by Code in a barrier free path of travel, provide opaque vision strips conforming to Article 3.3.1.18 of the Ontario Building Code in doors and sidelights, minimum 50 mm wide and mounted across the width of the door at a height of 1350 to 1500 mm above the finished floor. Vision strips as specified in Section 08 87 20.

3.9 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.
- .2 Perform cleaning to remove construction and accumulated environmental dirt.
- .3 Remove traces of primer, caulking.
- .4 Remove glazing materials from finish surfaces.
- .5 Remove labels after work is complete.
- .6 Clean glass using approved non-abrasive cleaner in accordance with manufacturer's instructions.
- .7 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.10 Protection of Finished Work

- .1 After installation, mark light with an "X" by using removable plastic tape.

End of Section

## PART 1 GENERAL

### 1.1 General

- .1 Conform to the requirements of Division 1.

### 1.2 Related Sections

- .1 Section 08 80 05 Glazing

### 1.3 References

- .1 ASTM International (ASTM)
  - .1 ASTM E84-23d Standard Test Method for Surface Burning Characteristics of Building Materials
  - .2 ASTM E308-22 Standard Practice for Computing the Colors of Objects by Using the CIE System
  - .3 ASTM E903-20 Standard Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres
  - .4 ASTM G155-21 Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Materials

### 1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Product Data: Manufacturer's data sheets on each product to be used, including:
  - .1 Preparation instructions and recommendations.
  - .2 Storage and handling requirements and recommendations.
  - .3 Installation methods.
- .3 Selection Samples: For each product specified, two complete sets of samples representing manufacturer's full range of available colours and patterns.
- .4 Verification Samples: For each finish product specified, two samples representing actual product, colour, and patterns.
- .5 Provide maintenance data for decorative window films for incorporation into Operation and Maintenance Manual specified in Section 01 78 00 – Closeout Submittals.

### 1.5 Performance Requirements

- .1 Fire Performance: Surface burning characteristics when tested in accordance ASTM E84:
  - .1 Flame Spread: maximum 25.
  - .2 Smoke Developed: maximum 450.

### 1.6 Quality Assurance

- .1 Manufacturer Qualifications: All primary products specified in this Section will be supplied by a single manufacturer with a minimum of ten years of experience.

- .2 Installer Qualifications: All products listed in this Section are to be installed by a single installer with a minimum of five years demonstrated experience in installing products of the same type and scope as specified.
- .3 Provide a Glass Stress Analysis of the existing glass and proposed glass/film combination as recommended by the film manufacturer.
- .4 Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
  - .1 Finish areas designated by Consultant.
  - .2 Do not proceed with remaining work until workmanship, colour, and sheen are approved by Consultant.
  - .3 Refinish mock-up area as required to produce acceptable work.

1.7 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Store products in manufacturer's unopened packaging until ready for installation.
- .3 Store and dispose of hazardous materials, and materials contaminated by hazardous materials, in accordance with requirements of local authorities having jurisdiction.

1.8 Project Conditions

- .1 Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.9 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

1.10 Warranty

- .1 Warrant the work of this Section against defects of workmanship and material, for a period of two years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

**PART 2 PRODUCTS**

2.1 Manufacturer

- .1 Acceptable Manufacturer: 3M Window Film.

2.2 Single Patterned Film

- .1 3M FASARA Glass Finishes, SH2MAGL, glaze, 50 in x 98.4 ft (1270 mm x 30 m)

### PART 3 EXECUTION

#### 3.1 Examination

- .1 Do not begin installation until substrates have been properly prepared.
- .2 If substrate preparation is the responsibility of another installer, notify Consultant of unsatisfactory preparation before proceeding.

#### 3.2 Preparation

- .1 Clean surfaces thoroughly prior to installation.
- .2 Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

#### 3.3 Installation

- .1 Install in accordance with manufacturer's instructions.
- .2 Cut film edges neatly and square at a uniform distance of 3 mm to 1.5 mm of window sealant. Use new blade tips after 3 to 4 cuts.
- .3 Spray the slip solution, composed of one capful of baby shampoo or dishwashing liquid to 1 gallon of water, on window glass and adhesive to facilitate proper positioning of film.
- .4 Apply film to glass and lightly spray film with slip solution.
- .5 Squeegee from top to bottom of window. Spray slip solution to film and squeegee a second time.
- .6 Bump film edge with lint-free towel wrapped around edge of a 5-way tool.
- .7 Upon completion of film application, allow 30 days for moisture from film installation to dry thoroughly, and to allow film to dry flat with no moisture dimples when viewed under normal viewing conditions.

#### 3.4 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.
- .2 Remove left over material and debris from Work area.
- .3 Use necessary means to protect film before, during, and after installation.
- .4 Touch-up, repair or replace damaged products before Substantial Performance.
- .5 After application of film, wash film using common window cleaning solutions, including ammonia solutions, 30 days after application. Do not use abrasive type cleaning agents and bristle brushes to avoid scratching film. Use synthetic sponges or soft cloths.

End of Section

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## PART 1 GENERAL

### 1.1 General

- .1 Conform to the requirements of Division 1.

### 1.2 Related Sections

- .1 Section 07 92 00 Joint Sealants
- .2 Section 08 11 00 Metal Doors and Frames
- .3 Section 08 80 05 Glazing

### 1.3 References

- .1 National Fire Protection Association (NFPA)
  - .1 NFPA 80 - 2022 Standard for Fire Doors and Other Opening Protectives
  - .2 NFPA 252 - 2022 Standard Methods of Fire Tests of Door Assemblies.
  - .3 NFPA 257 - 2022 Standard on Fire Test for Window and Glass Block Assemblies.
- .2 Underwriters Laboratories, Inc. (UL)
  - .1 UL 9 Fire Tests of Window Assemblies.
  - .2 UL 10B for Fire Tests of Door Assemblies.
  - .3 UL 10C Positive Pressure Fire Tests of Door Assemblies.
- .3 Underwriters Laboratories of Canada (ULC)
  - .1 CAN/ULC S104-15 Standard Method for Fire Tests of Door Assemblies
  - .2 CAN/ULC S106-15 Standard Method for Fire Tests of Window and Glass Block Assemblies
- .4 Consumer Products Safety Commission (CPSC)
  - .1 CPSC 16 CFR 1201 Safety Standard for Architectural Glazing Materials.
- .5 Glass Association of North America (GANA)
  - .1 GANA – Glazing Manual
  - .2 FGMA – Sealant Manual

### 1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Shop Drawings: Submit shop drawings showing layout, profiles and product components.
- .3 Samples: Submit 150 x 150 mm glass samples.
- .4 Technical Information: Submit latest edition of manufacturer's product data.
- .5 Provide maintenance data for fire resistant glazing for incorporation into Operation and Maintenance Manual specified in Section 01 78 00 – Closeout Submittals.

### 1.5 System Description

- .1 Performance Requirements: Provide a fire rating glazing manufactured, fabricated and installed to maintain performance criteria stated by manufacturer without defects, damage or failure.
  - .1 Fire Rating: Fire resistant glazing shall be fire rated from 20-180 minutes with hose stream and is impact safety rated to meet CPSC 16 CFR 1201 Category I and II.
  - .2 Fire resistant glazing shall be tested in accordance with NFPA 80, NFPA 252, NFPA 257, UL 9, UL 10B, UL 10C, ULC 104 and ULC 106.

.3 Testing Laboratory: Fire test shall be conducted by a nationally recognized independent testing laboratory.

.2 Listings and Labels: Fire rated glazing shall be under current follow-up service by a nationally recognized independent testing laboratory approved by OSHA and maintain a current listing or certification. Assemblies shall be labeled in accordance with limits of listings.

#### 1.6 Project Conditions

.1 Field Measurements: Verify actual measurements for openings by field measurements before fabrication. Show recorded measurements on shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

#### 1.7 Shipping, Handling and Storage

.1 Refer to Section 01 61 00 – Common Product Requirements.

.2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.

#### 1.8 Waste Management and Disposal

.1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

#### 1.9 Warranty

.1 Warrant the work of this Section against defects of workmanship and material, for a period of five years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

### PART 2 PRODUCTS

#### 2.1 Fire Rated Glazing

.1 Material:

.1 Fire protective impact safety rated laminated glass ceramic with hose stream, fire rating as indicated.

.2 Conforming to CAN/ULC S104 and CAN/ULC S106

.2 Product and Manufacturer:

.1 PYRAN Platinum L as manufactured by SCHOTT Technical Glass Solutions

.2 Keralite Select L as manufactured by VETROTECH SAINT-GOBAIN NORTH AMERICA INC

.3 Firelite Plus Premium as manufactured by Nippon Glass.

.3 Design Requirements:

.1 Thickness: 8 mm thick.

.2 Weight: 19.5 kg/m<sup>2</sup>

.3 Sound Transmission Rating: 36 STC.

.4 Appearance: Neutral colouration free of amber tints.

.5 Fire Rating: Fire rated from 20-180 minutes with hose stream.

.6 Impact Safety Rating: Meet CPSC 16 CFR 1201 Category I & II.

.7 Cradle to Cradle Certification: Must be C2C Silver Certified.

.8 Polished finish.

.9 ANZI Z97 Impact Safety Filmed and Laminated

.10 Environmental Impact: Manufacturing process and final composition free from toxins or hazardous heavy metals.

.4 Each piece of fire-rated glazing material shall be labeled with a permanent logo including name of product, manufacturer, testing laboratory and fire rating.

## 2.2 Accessories

- .1 Glazing Accessories: Manufacturer recommended fire rated glazing accessories as follows:
- .1 Glazing tape: Closed cell polyvinyl chloride (PVC) foam, Pemko Manufacturing Company, FG3000S90 or Unifax Corporation Fiberfrax Alumino-Silicate fiber glazing tape.
  - .2 Setting blocks: Calcium silicate or hardwood.
  - .3 Cleaners, primers, sealers: Type recommended by manufacturer of glass and gaskets.

## 2.3 Related Products

.1 Glazing shall be installed in an equally rated framing system.

## 2.4 Source Quality

- .1 Obtain fire rated glazing products from a single manufacturer.
- .2 Fabrication Dimensions: Fabricate to required dimensions.

# PART 3 EXECUTION

## 3.1 Manufacturer's Instructions

.1 Comply with manufacturer's product data including product technical bulletins and installation instructions.

## 3.2 Examination

.1 Verify substrate conditions, have been previously installed under other sections, and are acceptable for product installation in accordance with manufacturer's instructions.

## 3.3 Installation

- .1 Comply with referenced GANA manuals and instructions of manufacturers of glass, glazing sealants and glazing compounds.
- .2 Protect glass from edge damage during handling and installation. Inspect glass during installation and set aside pieces with edge damage that could affect performance.
- .3 Set units of glass in each series with uniformity of pattern, draw, bow and similar characteristics.
- .4 Cut glazing tape to length and set against permanent stops, flush with sight lines to fit openings exactly, with stretch allowance during installation.
- .5 Arrange two setting blocks located at quarter points of glass with edge block no more than 150 mm from corners.

- .6 Glaze vertically into labeled fire rated frames or fire rated walls with the same fire rating as the glass and push against tape for full contact at perimeter of pane or unit.
- .7 Place glazing tape on free perimeter of glazing in same manner described above.
- .8 Install removable stop and secure without displacing the tape.
- .9 Install so that appropriate markings remain permanently visible.
- .10 Field cutting or tampering is strictly prohibited.

#### 3.4 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.
- .2 Protect glass from contact with contaminating substances resulting from construction operations. Remove such substances by method approved by manufacturer.
- .3 Wash glass on both faces not more than four days prior to date schedule for inspections intended to establish date of Substantial Performance. Wash glass by method recommended by glass manufacturer.
- .4 Remove temporary coverings and protection of adjacent work areas.
- .5 Remove construction debris from project site and legally dispose of debris.

End of Section

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## PART 1 GENERAL

### 1.1 General

- .1 Conform to the requirements of Division 1.

### 1.2 Related Sections

- .1 Section 06 10 00 Rough Carpentry
- .2 Section 07 84 00 Firestopping
- .3 Section 07 92 00 Joint Sealants
- .4 Section 09 22 16 Non-Structural Metal Framing
- .5 Section 09 91 23 Interior Painting

### 1.3 References

- .1 ASTM International (ASTM)
  - .1 ASTM C514-04(2020) Standard Specification for Nails for the Application of Gypsum Board
  - .2 ASTM C840-20 Standard Specification for Application and Finishing of Gypsum Board
  - .3 ASTM C954-22 Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness
  - .4 ASTM C1002-22 Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs
  - .5 ASTM C1047-19 Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base
  - .6 ASTM C1396/C1396M - 17 Standard Specification for Gypsum Board
  - .7 ASTM E90-09(2016) Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
  - .8 ASTM E814-13a(2017) Standard Test Method for Fire Tests of Penetration Firestop Systems
  - .9 ASTM E1966-15(2019) Standard Test Method for Fire-Resistive Joint Systems
- .2 Underwriters Laboratories of Canada (ULC)
  - .1 ULC 102-2018 Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
  - .2 ULC 114-2018 Standard Method of Test for Determination of Non-Combustibility in Building Materials
  - .3 ULC 129- 2015 Standard Method of Test for Smoulder Resistance of Insulation (Basket Method)
  - .4 ULC List of Equipment and Material, Volume III, Fire Resistance Ratings.
- .3 Gypsum Association (GA)
  - .1 GA-214-2022 Recommended Levels of Gypsum Board Finish.
  - .2 GA-216-2021 Application and Finishing of Gypsum Board.
- .4 Wall and Ceiling Bureau
  - .1 Technical Bulletin Control Joint Placement in Gypsum Board Assemblies

### 1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for gypsum board assemblies and include product characteristics, performance criteria, physical size, finish and limitations.

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1.5 Quality Assurance

- .1 Dry wall installers: minimum 5 years proven experience.
- .2 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .3 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.6 Design Requirements

- .1 Where indicated provide minimum sound transmission rating of installed partitions of STC 50 tested to ASTM E90.
- .2 Provide fire resistance rating of installed partitions as indicated and according to referenced ULC design.

1.7 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.
- .3 Protect gypsum board materials before, during and after installation and to protect the installed work and materials of other trades affected by this work. Store materials in a dry area inside the building. Do not remove wrapping until ready for use. Prevent damage to all edges and surfaces.

1.8 Project Conditions

- .1 Maintain temperature minimum 10 ° C, maximum 21 ° C for 48 hours prior to and during application of gypsum boards and joint treatment, and for at least 48 hours after completion of joint treatment.
- .2 Apply board and joint treatment to dry, frost free surfaces.
- .3 Ventilation: Ventilate building spaces as required to remove excess moisture that would prevent drying of joint treatment material immediately after its application.

1.9 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

**PART 2 PRODUCTS**

2.1 Gypsum Board

- .1 To ASTM C1396/C1396M. Standard for non-rated applications, Type X for rated applications, 1220 mm wide x maximum practical length, ends square cut, edges tapered with round edge, 12.7 mm thick or to thickness indicated on drawings. All fire rated board shall be minimum 16 mm thickness.

2.2 Fastening and Adhesives

- .1 Drywall Screws: To ASTM C954 or ASTM C1002 self-drilling, self-tapping, case hardened, length to suit board thickness and provide minimum 12 mm penetration into support.

- .2 Joint Tape: To ASTM C475, 50 mm perforated with preformed seam, mould and mildew resistant.
  - .1 Joint tape for abuse resistant gypsum board: CGC Mould Resistant Fiberglass Drywall Tape.
- .3 Joint Filler and Topping: To ASTM C475 vinyl or latex base, slow setting.

### 2.3 Acoustic Insulation

- .1 Acoustic Attenuation: Min 50 STC in accordance with ASTM E90.
- .2 Acoustic Insulation: Glass Fibre Acoustic Insulation:
  - .1 QUIETZONE Acoustic Blanket insulation manufactured by Owens Corning Canada or approved equivalent.
- .3 Thickness to suit depth of wall framing and as indicated.
- .4 Acoustic sealant: as specified in Section 07 92 00 - Joint Sealants.

### 2.4 Accessories

- .1 Casing beads, corner beads, control joints and edge trim: to ASTM C1047, zinc-coated by hot-dip process 0.5 mm base thickness, perforated flanges, one piece length per location.
- .2 Insulating Strip: Rubberized, moisture resistant, 3.0 mm thick, 12 mm wide closed cell neoprene strip, with self-sticking permanent adhesive on one face; lengths as required.
- .3 Sealants: as specified in Section 07 92 00 - Joint Sealants.

## PART 3 EXECUTION

### 3.1 General

- .1 Unless otherwise indicated on the drawings, all gypsum board partitions shall extend from floor level to the underside of floor or roof structures above.

### 3.2 Acoustic Insulation

- .1 Install acoustic blankets full width and length, with tight joints, between wall framing and around penetrating electrical service boxes, piping, air ducts and frames.
- .2 Place acoustic blankets where indicated on the Drawings and to thickness required to obtain acoustic performance indicated for the assembly.
- .3 Place acoustic blankets between studs ensuring friction fit, free of sags, folds or open joints that may let sound pass through.
- .4 Install blankets from the bottom up, tightly adjusted and trim accurately with a utility knife.

### 3.3 Gypsum Board Application

- .1 Do application and finishing of gypsum board in accordance with ASTM C840 and/or GA-216 except where specified otherwise.

- .2 Do not apply gypsum board until bucks, anchors, blocking, electrical, and mechanical work are approved.
- .3 Apply gypsum board at right angles to framing members or furring using screw fasteners. Maximum spacing of screws 300 mm o.c.
- .4 Carry gypsum board from floor to underside of floor or roof structure above. Furr out and carry gypsum board around any structural members as may be required. Neatly cope gypsum board to fill deck flutes where gypsum board abuts floor or roof deck.

### 3.4 Accessories

- .1 Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges.
- .2 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated.
- .3 Install insulating strips continuously at edges of gypsum board or casing beads abutting exterior door or window frames, to provide thermal break.
- .4 Install continuous bead of acoustic sealant at all penetrations through sound control partitions.
- .5 Provide control joints in gypsum board facing. Construct control joints in accordance with ASTM C840 and as described in Wall and Ceiling Bureau Technical Bulletin "Control Joint Placement in Gypsum Board Assemblies". Place control joints consistent with lines of building spaces as indicated. Where not indicated install as directed at maximum 6.0 m spacing. Control joints shall be supported with metal studs or furring channels on both sides of the joint. Construct joints using back-to-back casing beads filled with a low modulus sealant capable of flexible joint movement. Maintain fire-resistance rating of wall assemblies. Control joints shall be provided:
  - .1 At abutting structural elements, steel columns.
  - .2 At expansion or control joints in the substrate.
  - .3 At each door jamb.

### 3.5 Access Doors

- .1 Install access doors to electrical and mechanical fixtures specified in respective Sections.
- .2 Rigidly secure frames to furring or framing systems, to satisfy fire rating requirements.

### 3.6 Taping and Filling

- .1 Finish face panel joints and internal angles with joint system consisting of joint compound, joint tape and taping compound installed according to manufacturer's directions and feathered out onto panel faces. Finish to GA-214 Level 5.
- .2 Finish corner beads, control joints and trims as required with two coats of joint compound and one coat of taping compound, feathered out onto panel faces.
- .3 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board so as to be invisible after painting is completed.

- .4 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.
- .5 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for painting.

3.7 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

## PART 1 GENERAL

### 1.1 General

- .1 Conform to the requirements of Division 1.

### 1.2 Related Sections

- .1 Section 09 21 16 Gypsum Board

### 1.3 References

- .1 ASTM International (ASTM).
  - .1 ASTM A653/A653M-23 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
  - .2 ASTM C645-18 Standard Specification for Nonstructural Steel Framing Members
  - .3 ASTM C754-20 Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products
  - .4 ASTM C841-03(2018) Standard Specification for Installation of Interior Lathing and Furring.
  - .5 ASTM C1002-22 Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs
  - .6 ASTM E90-09(2016) Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
  - .7 ASTM E814-13a(2017) Standard Test Method for Fire Tests of Penetration Firestop Systems
  - .8 ASTM E1966-15(2019) Standard Test Method for Fire-Resistive Joint Systems
- .2 Canadian General Services Board (CGSB).
  - .1 CAN/CGSB-1.40-97 Primer, Structural Steel, Oil Alkyd Type.
- .3 Underwriters Laboratories of Canada (ULC)
  - .1 ULC List of Equipment and Material, Volume III, Fire Resistance Ratings.
- .4 CSSBI Lightweight Steel Framing Manual

### 1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for metal framing and include product characteristics, performance criteria, physical size, finish and limitations.

### 1.5 Quality Assurance

- .1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .3 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.6 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.

1.7 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Metal Stud Framing Systems

- .1 Non-load bearing channel stud framing: to ASTM C645, stud size as indicated, roll formed from 0.53 mm thickness hot dipped galvanized steel sheet, for screw attachment of gypsum board. Knock-out service holes at 460 mm centres.
  - .1 Thickness of materials to conform to referenced standards unless noted otherwise.
  - .2 Thickness of materials shall be selected from manufacturer's standard span tables to suit total height requirements.
- .2 Floor and ceiling tracks: to ASTM C645, in widths to suit stud sizes, 32 mm flange height.
- .3 Metal channel stiffener: 1.4 mm thick cold rolled steel, coated with rust inhibitive coating.
- .4 Tie Wire: 0.90 mm, galvanized, soft annealed, steel wire or clip as recommended by the manufacturer of furring channels.
- .5 Wind bearing light weight steel stud framing for exterior wall applications is specified in Section 05 41 00.

2.2 Metal Furring and Suspension Systems

- .1 Channel framing: to ASTM C645, stud size as indicated, roll formed from 0.53 mm thickness hot dipped galvanized steel sheet, for screw attachment of gypsum board.
  - .1 Thickness of materials to conform to referenced standards unless noted otherwise.
- .1 Metal Furring Runners, Hangers, Tie Wires, Inserts, Anchors: to ASTM C645 , electro-zinc coated steel.
- .2 Runner Channels: 38 x 19 x 0.59 mm and 38 x 9.5 x 0.45 mm, hot dip or electro-galvanized sheet steel. Use of various sizes governed by applied loads and applicable spans.
- .3 Drywall Furring Channel: Channel shaped furring member for screw attachment of drywall with knurled face. For interior use. Furring masonry or concrete surfaces. Cross furring under steel joist or suspended metal channels in suspended ceiling systems: 70 x 22 x 0.9 mm with knurled face, hot dip or electro-galvanized sheet steel. Bailey D-1001.
- .4 Deflection Track: Bailey Multi-Slot Track MST 250, size to suit studs, and top deflection clips TDC 350 and TDC 587.
- .5 Horizontal Flange attachment: Bailey Horizontal Flange Attachment Clip (HFA Clip)

- .6 Hangers: minimum 4.1 mm diameter (or as required by ULC fire rating design requirements) mild steel rods.

## 2.2 Fasteners

- .1 Powder activated fasteners: to suit structural conditions and fastening requirements and in accordance with manufacturer's recommendations: Ramset; Hilti; or approved equivalent.
- .2 Sheet Metal Screws: To ASTM C1002, self-drilling, self-tapping, case hardened, length to suit board thickness and provide minimum 12 mm penetration into support.

## 2.3 Accessories

- .1 Acoustic sealant: As specified in Section 07 92 00.
- .2 Insulating strip: rubberized, moisture resistant 3 mm thick foam strip, 12 mm wide, with self-sticking adhesive on one face, lengths as required.
- .3 Zinc Rich Paint: to CGSB 1-GP-181M. Low VOC type.

## PART 3 EXECUTION

### 3.1 Examination

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for non-structural metal framing application in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Consultant.
  - .2 Inform Consultant of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied [and after receipt of written approval to proceed from Consultant.

### 3.2 Erection

- .1 Comply with ASTM C754.
- .2 All gypsum board shall be supported with steel framing whether indicated or not.
- .3 Unless otherwise indicated on the drawings, all gypsum board partitions shall extend from floor level to the underside of floor or roof structures above.
- .4 Align partition tracks at floor and ceiling and secure at 600 mm on centre maximum. Provide top deflection tracks where indicated or as required to permit structural deflection. Install top deflection clips as necessary to increase load capacity.
- .5 Install damp proof course under stud shoe tracks of partitions on slabs on grade.
- .6 Place studs vertically at 400 mm on centre unless noted otherwise and not more than 50 mm from abutting walls, and at each side of openings and corners. Position studs in tracks at floor and ceiling. Cross brace steel studs as required to provide rigid installation to manufacturer's instructions.
- .7 Erect metal studding to tolerance of 1:1000.

- .8 Attach studs to bottom and ceiling track using screws.
- .9 Co-ordinate simultaneous erection of studs with installation of service lines. When erecting studs ensure web openings are aligned.
- .10 Co-ordinate erection of studs with installation of door/window frames and special supports or anchorage for work specified in other Sections.
- .11 Provide two studs extending from floor to ceiling at each side of openings wider than stud centres specified. Secure studs together, 50 mm apart using column clips or other approved means of fastening placed alongside frame anchor clips.
- .12 Install heavy thickness single jamb studs at openings.
- .13 Erect track at head of door/window openings and sills of window openings to accommodate intermediate studs. Secure track to studs at each end, in accordance with manufacturer's instructions. Install intermediate studs above and below openings in same manner and spacing as wall studs.
- .14 Frame openings and around built-in equipment, cabinets, access panels, on four sides. Extend framing into reveals. Check clearances with equipment suppliers.
- .15 Provide 40 mm stud or furring channel secured between studs for attachment of fixtures behind lavatory basins, toilet and bathroom accessories, and other fixtures including grab bars and towel rails, attached to steel stud partitions.
- .16 Install steel studs or furring channel between studs for attaching electrical and other boxes.
- .17 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs. Use 50 mm leg ceiling tracks.
- .18 Install continuous insulating strips to isolate studs from un-insulated surfaces.
- .19 Install two continuous beads of acoustical sealant under studs and tracks around perimeter of sound control partitions.

### 3.3 Wall Furring

- .1 Install wall furring for gypsum board wall finishes in accordance ASTM C754 and ASTM C841 except where specified otherwise and indicated on drawings.
- .2 Frame openings and around built-in equipment, cabinets, access panels, etc., on four sides. Extend furring into reveals. Check clearances with equipment suppliers.
- .3 Furr duct shafts, beams, columns, pipes and exposed services where indicated.

### 3.4 Suspended and Furred Ceilings and Bulkheads

- .1 Erect hanger and runner channels for suspended gypsum board ceilings and bulkheads in accordance with ASTM C754 and ASTM C841 except where specified otherwise and indicated on drawings.
- .2 Securely anchor hanger to structural supports 1220 mm o.c. maximum along runner channels and not more than 150 mm from ends. Under no circumstances shall hanger wires be secured to

or supported from mechanical or electrical materials or equipment or penetrate mechanical ductwork.

- .3 Space runner or furring channels as shown on drawings and not more than 610 mm o.c. maximum nor 150 mm from walls. Run channels in long direction of board. Bend hanger sharply under bottom flange of runner and securely wire in place with a saddle tie. Provide channels below mechanical or electrical equipment and mechanical ductwork to maintain maximum spacing.
- .4 Install furring channels transversely across runner channels in short direction of wallboard at 610 mm o.c. maximum or 150 mm from walls and interruptions in ceiling continuity. Secure channels to support with furring clips or wire. Where splicing is necessary lap minimum 200 mm and wire tie each end with double loops of 0.90 mm galvanized tie wire, 25 mm from each end of overlap.
- .5 Support light fixtures by providing additional ceiling suspension hangers within 150 mm of each corner and at maximum 610 mm around perimeter of fixture. Coordinate with Electrical.
- .6 Install work level to tolerance of 1:1200.
- .7 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers, grilles, etc.
- .8 Install furring channels parallel to, and at exact locations of steel stud partition header track.
- .9 Furr for gypsum board faced vertical bulkheads within or at termination of ceilings.

### 3.5 Gypsum Board

- .1 Installation of gypsum board is specified in Section 09 21 16

### 3.6 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.
- .2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

End of Section

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## PART 1 GENERAL

### 1.1 General

- .1 Conform to the requirements of Division 1.

### 1.2 Related Sections

- .1 Section 07 92 00 Joint Sealants
- .2 Section 09 21 16 Gypsum Board

### 1.3 References

- .1 ASTM International (ASTM)
  - .1 ACTM C144-18 Standard Specification for Aggregate for Masonry Mortar
  - .2 ASTM C150/C150M-22 Standard Specification for Portland Cement
  - .3 ASTM C207-18 Standard Specification for Hydrated Lime for Masonry Purposes
  - .4 ASTM C627-18e1 Standard Test Method for Evaluating Ceramic Floor Tile Installation Systems using the Robinson-Type Floor Tester
- .2 American National Standards Institute (ANSI)
  - .1 ANSI A108/A118/A136.1:2017 American National Specifications for the Installation of Ceramic Tile.
  - .2 ANSI A137.1: 2017 American National Standard Specifications for Ceramic Tile
- .3 International Standards Organization (ISO)
  - .1 ISO 10545 Series Ceramic Tiles, Standards for Testing
  - .2 ISO 13006-2012 Ceramic Tiles, Definitions, Classifications, Characteristics and Marking.
  - .3 ISO 13007-2010 Ceramic Tiles, Grouts and Adhesives.
- .4 Terrazzo, Tile and Marble Association of Canada (TTMAC)
  - .1 TTMAC 2019-2021 Specifications Guide 09 30 00, Tile Installation Manual.
  - .2 TTMAC Hard Surface Maintenance Guide.

### 1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Provide product data. Include manufacturer's information on:
  - .1 Ceramic tile, marked to show each type, size, and shape required.
  - .2 Mortar and grout.
  - .3 Divider strip.
  - .4 Levelling compound.
  - .5 Waterproofing isolation membrane.
- .3 Submit duplicate samples of tile. Samples to be submitted on 300 x 600 mm sample board for each colour, texture, size and pattern of tile. Grout sample joints for representative sample of final installation.
- .4 Trim and Accessories: submit duplicate samples of each trim.
- .5 Maintenance Data: Provide maintenance data for tile work, for incorporation into Maintenance Manuals specified under Section 01 78 00.

1.5 Quality Assurance

- .1 Do tile work in accordance with Installation Manual 200, Ceramic Tile, by Terrazzo, Tile and Marble Association of Canada (TTMAC), except where this specification is more stringent.
- .2 For the installation of ceramic tile, use only skilled tradesmen who are familiar with the referenced standards and with the requirements for this Work.
- .3 The setting material manufacturer's representative shall review the details with the Contractor prior to the start of work. Instruct the Contractor on the proper installation procedures to ensure compliance with the guarantee requirements.

1.6 Performance Requirements

- .1 Floor Traffic Load Bearing performance: Provide installations rated for the following load bearing performance in accordance with ASTM C627 for ceramic tile installed on walkway surfaces:
  - .1 Moderate: passes cycles 1 through 10.

1.7 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Deliver packaged materials in original unopened containers.
- .3 Keep delivered material dry and free from stains. Store cementitious material off damp surfaces.
- .4 Use all means necessary to protect materials, before, during and after installation and to protect the installed work and materials of all other trades.
- .5 In the event of damage, immediately make all repairs and replacements necessary to the approval of the Consultant and at no additional cost to the Owner.
- .6 Deliver, handle and store materials in accordance with manufacturer's printed instructions.

1.8 Project Conditions

- .1 Maintain air temperature and structural base temperature at ceramic tile installation area above 12 °C for 48 hours before, during and after installation.
- .2 Do not install tiles at temperatures less than 12 °C or above 38 °C.
- .3 Do not apply epoxy mortar and grouts at temperatures below 15 °C or above 25 °C.
- .4 Provide and maintain temporary lighting. Lighting levels shall be sufficient to complete work including inspections. Provide minimum lighting levels of 400 lux at work areas.

1.9 Qualifications

- .1 Installer of ceramic tiles shall have a minimum of 10 years of experience including at least five projects of similar scope and scale. Submit documented proof of experience prior to commencing work of this Section.

1.10 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

1.11 Maintenance

- .1 Upon completion of the installation and as a condition of acceptance, deliver to the Owner 2% of tile and accessory tiles in each colour and pattern of ceramic tiles installed under this Section for the Owners maintenance program. Identify each carton for location and installation date. Submission must be made all at one time and prior to Substantial Performance.

1.12 Warranty

- .1 Warrant the work of this Section against defects of workmanship and material, for a period of five years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

PART 2 PRODUCTS

2.1 Materials

- .1 Materials shall be graded and containers grade sealed, delivered to the job site in their original packages or containers with the manufacturer's labels and seals intact.
- .2 Tile and grout colours shall be selected by the Consultant from the manufacturer's standard range of colours.
- .3 Tile shall conform to ANSI A137.1.
- .4 Floor tile shall have coefficient of slip resistance conforming to ANSI A137.1.
- .5 Provide coves, corners, reveals, surf caps, inners and outers as required to complete the work.
- .6 Metal Lath: ASTM C847 corrosion resistant. 1.4 kg/m<sup>2</sup>.

2.2 Ceramic Tile

- .1 PT1: Porcelain Floor Tile and Base: Daltile Articulo Feature Beige AR07 Matte.

2.3 Mortar, Adhesives and Grout Material

- .1 Primer: Low VOC, low viscosity primer as recommended by manufacturer to suit substrate and site conditions; provide proof of bonding ability of setting systems where manufacturer recommends that a primer is not necessary to installation.
- .2 Surface Preparation Materials:
  - .1 Portland Cement Mortar: Scratch and bond coat, levelling bed containing the following:
    - .1 Portland Cement: Meeting or exceeding requirements of CSA A3000, Type GU.
    - .2 Hydrated Lime: Meeting or exceeding requirements of ASTM C207, Type N.
    - .3 Sand: Meeting or exceeding requirements of ASTM C144, passing 16 mesh.
    - .4 Water: Potable.
  - .2 Self Levelling and Smoothing Underlayment: Cementitious and self levelling smoothing underlayment meeting or exceeding requirements of ANSI A108.1, Type 2.

.3 Floor Tile Systems:

- .1 Thin Set Interior Installation: Latex-Portland cement mortar meeting or exceeding requirements of ANSI A118.1, rated for floor traffic load bearing performance indicated above.

.4 Adhesive Systems:

- .1 Epoxy Adhesive: Thin set adhesive system using 100% solids epoxy resin and epoxy hardener meeting or exceeding requirements of ANSI A108.1; stain proof, chemical resistant and having high temperature resistance and water cleanable.

.5 Tile Grout Systems:

- .1 Epoxy Grout: Water cleanable, chemical resistant, factory blended modified Portland cement compound with 100% epoxy adhesives and hardeners meeting or exceeding requirements of ANSI A118.3.

2.4 Patching and Levelling Compound

- .1 Portland cement base, acrylic polymer compound, manufactured specifically for resurfacing and levelling concrete floors, capable of being applied in layers up to 50 mm thick, being brought to feather edge, and being trowelled to smooth finish and having not less than the following physical properties:
- .1 Compressive strength: 25 MPa.
  - .2 Tensile strength: 7 MPa.
  - .3 Flexural strength: 7 MPa.
  - .4 Density: 1.9
  - .5 Products containing gypsum are not acceptable.
- .2 Levelling Compound: Laticrete 3701 latex or 226 Mapecem mortar mixed with Planicrete 50.

2.5 Floor Sealer and Protective Coating

- .1 To tile and grout manufacturer's recommendations.

2.6 Accessories

- .1 Reducers, edge trim, and transition strips: Schluter Systems purpose made aluminum.
- .2 Sealant: as specified in Section 07 92 00.

2.7 Mixes

- .1 Mix premanufactured mortars and grouts in accordance with referenced standards, and mortar and grout manufacturer's written instructions; mix site mixed materials as follows:
- .1 Scratch Coat (by volume): Mix 1 part Portland cement, 4 parts sand, and latex additive where required by TTMAC detail.

**PART 3 EXECUTION**

3.1 Surface Conditions

- .1 Surfaces on which tile is to be applied, shall be thoroughly cleaned down.
- .2 Verify that concrete substrates have been allowed to cure for a minimum of 28 days in

accordance with TTMAC requirements.

- .3 Verify that substrates for bonding tile are firm; dry; clean; free from oil, waxy films, and curing compounds; and are within starting flatness tolerances as specified in Section 03 30 00 and are ready for application of levelling materials specified in this Section.
- .4 Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of Work, and similar items located in or behind tile have been completed before installing tile.
- .5 Drywall surfaces on which floor tile is to be applied, shall be free from dust, excess plaster and shall be plain and true without any irregularities. Prepare existing gypsum board surfaces as recommended by TTMAC and product manufacturer to support tile installation.
- .6 In the event of discrepancies, immediately notify the Consultant and do not proceed with installation in such areas until all such discrepancies have been fully resolved.
- .7 Check that conditions of temperature, humidity, traffic and usage are suitable as required by Installation Manual specifications. Minimum temperature to be not less than 10°C.
- .8 Check that surfaces ready to receive tiling are cured, level and/or graded, plumb, smooth, firm, free from loose particles, droppings, projection, grease, solvent, paint and other foreign matter and from other unsuitable conditions.
- .9 Install transition strips, reducers and edge trim at exposed edges of all tiled floors in accordance with manufacturer's instructions.

### 3.2 Installation

- .1 Install tiling in accordance with requirements of TTMAC Tile Installation Manual and parts of ANSI A108 Series of tile installation standards that apply to types of bonding and grouting materials, and to methods required for complete tile installation.
- .2 Extend tile work into recesses and under or behind equipment and fixtures to form a complete covering without interruptions:
  - .1 Terminate Work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
  - .2 Make cut edges smooth, even and free from chipping.
  - .3 Do not split tile.
- .3 Accurately form intersections and returns; perform cutting and drilling of tile without marring visible surfaces:
  - .1 Cut, drill, and fit tile to accommodate work of other subcontractors penetrating or abutting work of this Section.
  - .2 Carefully grind cut edges of tile abutting trim, finish, or built in items for straight aligned joints.
  - .3 Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so that plates, collars, or covers overlap tile and to provide a uniform joint appearance.
- .4 Lay tile in pattern indicated on Drawings and as follows:
  - .1 Align joints when adjoining tiles on floor, base and trim are the same size.
  - .2 Centre tile patterns between control and movement joints; notify Consultant for further instructions where tile patterns do not align with control or movement joints.
  - .3 Cut tile accurately and without damage.
  - .4 Smooth exposed cut edges with abrasive stone, where exposed.
  - .5 Chipped or split edges are not acceptable.

- .5 Bonding Bed: Set tile in place while bond coat is wet and tacky and as follows:
- .1 Adjust amount of bonding materials placed on substrates based on temperature and humidity to prevent skinning over of bonding materials.
  - .2 Use sufficient bond coat to provide a minimum 80% contact for tiles smaller than 300 mm x 300 mm with bonding material evenly dispersed and pressed into back of tile; refer to back buttering requirements for larger materials and installations having Moderate or higher Load Bearing Performance requirements.
  - .3 Notch bond coat in horizontal straight lines and set on freshly placed bonding material while moving (sliding) tile back and forth at 90° to notches.
  - .4 Verify that corner and edges are fully supported by bonding material.
  - .5 Set tiles to prevent lippage greater than 1 mm over a 3 mm grout joint.
  - .6 Keep two-thirds of grout joint depth free of bonding materials.
  - .7 Clean excess bonding materials from tile surface prior to final set.
  - .8 Sound tiles after bonding materials have cured and replace hollow sounding tile before grouting.
- .6 Back Buttering: Obtain 100% mortar coverage in accordance with applicable requirements for back buttering of tile in referenced TTMAC and ANSI A108 series of tile installation standards for the following applications:
- .1 Tile installed with chemical resistant mortars and grouts
  - .2 Tile 300 mm or larger in any direction
  - .3 Tile with raised or textured backs.
  - .4 Tile installation rated for Heavy or Extra Heavy Duty.
  - .5 All porcelain tiles with more than 20% of the tile backs covered with firing release dust back buttered so that 100% of the back is covered with adhesive mortar rated for C627, Extra Heavy Duty rating.
- .7 Install prefabricated edge strips and control at locations indicated or where exposed edge of floor tile meets different flooring materials and exposed substrates.
- .8 Protect exposed edges of floor tile with properly sized transition strips, use sloped reducer strips where uneven transitions between 6 mm and 13 mm occur.
- .9 Control and Movement Joints: Install control joints and expansion joints in tile work in accordance with TTMAC Detail 301MJ; keep control and expansion joints free of bonding materials and as follows:
- .1 Cut tiles to establish line of joints; sawn joints after installation of tiles will not be acceptable.
  - .2 Locate joints in tile surfaces directly above joints in concrete substrates.
  - .3 Provide floor control joints over structural control joints.
  - .4 Install prefabricated joint profiles in accordance with manufacturer's written instructions, set with top surface of joint profile slightly below top surface of tile.
  - .5 Prepare joints and apply sealants in accordance with requirements of Section 07 92 00.
  - .6 Keep control and movement joints free from setting materials.
  - .7 Form an open joint for sealant in tile wherever a change in backing material occurs, at all vertical interior corners, around penetrating pipes and fixtures, and where tile abuts other materials or fixtures.
  - .8 Install control joints where indicated or at not less than the flowing spacings:

Environment	Minimum	Maximum	Joint Width (minimum)
Interior/Shaded	4800 mm	6100 mm	6 mm

### 3.3 Grouting

- .1 Grouting: Install grout in accordance with manufacturer's written instructions, the requirements of TTMAC, and as follows:
  - .1 Allow proper setting time before application of grout.
  - .2 Pre-seal or wax tiles requiring protection from grout staining.
  - .3 Force grout into joints to a smooth, dense finish.
  - .4 Remove excess grout in accordance with manufacturer's written instructions and polish tile with clean cloths.
- .2 Grout all tile using specified grout in strict accordance with manufacturers written instructions all to give a flush, hard joint.
- .3 Joints in tile shall be filled solid and flush with grout.
- .4 Prepare joints and mix grout in accordance with manufacturer's printed instructions. Force maximum amount of grout into joints, avoiding air traps or voids.
- .5 Remove all excess grout by washing diagonally across the joints. Check for voids, air pockets and gaps and fill same. Remove all discoloured grout and replace with new.
- .6 Cure all joints.

### 3.4 Floor Sealer and Protective Coatings

- .1 Apply in accordance with manufacturer's instructions.

### 3.5 Cleaning and Protection

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.
- .2 Cleaning: Clean tile surfaces so they are free of foreign matter using manufacturer recommended cleaning products and methods after completion of placement and grouting and as follows:
  - .1 Remove grout residue from tile as soon as possible.
  - .2 Unglazed tile may be cleaned with acid solutions only when permitted by tile and grout manufacturer's written instructions, but no sooner than 10 days after installation; protect metal surfaces, cast iron, and vitreous plumbing fixtures from effects of acid cleaning.
  - .3 Flush surface with clean water before and after cleaning.
- .3 Protection: Leave finished installation clean and free of cracked, chipped, broken, unbonded, or other tile deficiencies as follows:
  - .1 Protect finished areas from traffic until setting materials have sufficiently cured in accordance with TTMAC requirements.
  - .2 Provide protective covering until Substantial Performance of the Work.

End of Section

## PART 1 GENERAL

### 1.1 General

- .1 Conform to the requirements of Division 1.

### 1.2 Related Sections

- .1 Section 09 21 16 Gypsum Board
- .2 Section 09 53 00 Acoustical Suspension

### 1.3 References

- .1 ASTM International (ASTM)
  - .1 ASTM C423-23 Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
  - .2 ASTM E84-23c Standard Test Method for Surface Burning Characteristics of Building Materials
  - .3 ASTM E1264-22 Standard Classification for Acoustical Ceiling Products
  - .4 ASTM E1414/E1414M-21a Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum
  - .5 ASTM E1477-98a(2022) Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers
- .2 Underwriters Laboratories of Canada (ULC)
  - .1 ULC 102-2018 Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

### 1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Product Data: Submit manufacturer's technical data for each type of acoustical ceiling unit and suspension system required.
  - .1 Acoustical Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards. For acoustical performance, each carton of material must carry an approved independent laboratory classification of NRC, CAC, and AC.
- .3 Submit duplicate 300 x 300 mm samples of each type of acoustical units.
- .4 Provide maintenance data for acoustic panel ceilings for incorporation into Operation and Maintenance Manual specified in Section 01 78 00 – Closeout Submittals.

### 1.5 Quality Assurance

- .1 Single-Source Responsibility: Provide acoustical panel units and grid components by a single manufacturer.
  - .1 Fire Performance Characteristics: Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting organization.
  - .2 Surface Burning Characteristics: As follows, tested per ASTM E84 and complying with ASTM E1264 Classification.
  - .3 Fire Resistance: As follows tested per ASTM E119 and listed in the appropriate floor or roof design in the Underwriters Laboratories Fire Resistance Directory

- .2 Coordination of Work: Coordinate acoustical ceiling work with installers of related work including, but not limited to building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.

#### 1.6 Project Conditions

- .1 Permit wet work to dry before beginning to install.
- .2 Maintain uniform minimum temperature of 15° C and humidity of 20-40% before and during installation.
- .3 Store materials in work area 48 hours prior to installation.
- .4 Building areas to receive ceilings shall be free of construction dust and debris.

#### 1.7 Performance Requirements

- .1 Surface-Burning Characteristics: Conform to ULC S102 or ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- .2 Seismic Performance: Acoustical ceiling shall withstand the effects of earthquake motions determined according to applicable code.

#### 1.8

##### Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.
- .3 Protect on site stored or installed absorptive material from moisture damage.

#### 1.9 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

#### 1.10 Extra Materials

- .1 Provide extra materials of acoustic units in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Provide acoustical units amounting to 5% of gross ceiling area for each pattern and type required for project.
- .3 Ensure extra materials are from same production run as installed materials.

### PART 2 PRODUCTS

#### 2.1 Materials

- .1 Acoustic units for suspended ceiling system: to ASTM E1264
- .2 Panel Type 1: CGC Mars ClimaPlus with STL shadowline tapered reveal edge.
  - .1 Class A.

- .2 Composition: Wet Formed Mineral Fiber
  - .3 Pattern regular fissured.
  - .4 Texture: medium.
  - .5 Flame spread: ASTM E1264-98, Class A (U.L.C.), 25 or less.
  - .6 Smoke developed 50 or less in accordance with ULC 102.
  - .7 Noise Reduction Coefficient (NRC): ASTM C423; Classified with UL label, 0.75
  - .8 Ceiling Attenuation Class (CAC): ASTM C1414; Classified with UL label, 35
  - .9 Light Reflectance (LR) range of 0.90 to ASTM E1477.
  - .10 Dimensional Stability: Standard
  - .11 Edge Profile: Shadowline Tapered (STL)
  - .12 Colour: White.
  - .13 Size 610 x 610 x 19 mm thick.
  - .14 Shape flat.
  - .15 Surface coverings: Ecolabel certified paint.
- .3 Alternate manufacturer: Products as manufactured by the following are acceptable, subject to Consultants approval of style, finish, performance characteristics and texture:
- .1 Armstrong Industries
  - .2 Certainteed
- .4 Ceiling Suspension System: as specified in Section 09 53 00.

### **PART 3 EXECUTION**

#### **3.1 Examination**

- .1 Do not install acoustical panels until work above ceiling has been inspected by Consultant.

#### **3.2 Installation**

- .1 Co-ordinate with Section 09 53 00 - Acoustical Suspension.
- .2 Coordinate layout and installation of ceilings with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, and fire-suppression system.
- .3 Install acoustical panels and tiles in ceiling suspension system.
- .4 Install acoustical units parallel to building lines with edge unit not less than 50% of unit width, with directional pattern running in same direction. Refer to reflected ceiling plan.
- .5 Scribe acoustic units to fit adjacent work. Butt joints tight, terminate edges with moulding.

#### **3.3 Cleaning**

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

## PART 1 GENERAL

### 1.1 General

- .1 Conform to the requirements of Division 1.

### 1.2 Related Sections

- .1 Section 09 21 16 Gypsum Board
- .2 Section 09 51 13 Acoustic Panel Ceilings

### 1.3 References

- .1 ASTM International (ASTM)
  - .1 ASTM A307-21 Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength
  - .2 ASTM A641/A641M-19 Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
  - .3 ASTM A653 / A653M – 23 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
  - .4 ASTM A1011/A1011M-23 Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength
  - .5 ASTM C635/C635M-22 Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay in Panel Ceilings.
  - .6 ASTM C636/C636M-19 Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
  - .7 ASTM E84-23c Standard Test Method for Surface Burning Characteristics of Building Materials
  - .8 ASTM E119-22 Standard Test Methods for Fire Tests of Building Construction and Materials
  - .9 ASTM E1264-22 Standard Classification for Acoustical Ceiling Products

### 1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Product Data: Submit manufacturer's technical data for each type of acoustical ceiling unit and suspension system required.
- .3 Acoustical Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards.
- .4 Submit one representative model of each type of ceiling suspension system.
  - .1 Ceiling system to show basic construction and assembly, treatment at walls, recessed fixtures, splicing, interlocking, finishes, acoustical unit installation.

### 1.5 Design Requirements

- .1 Determine the superimposed loads that will be applied to suspension systems by components of the building other than the ceiling and ensure that adequate hangers are installed to support the additional loads in conjunction with the normal loads of the system.

- .2 Design supplemental suspension members and hangers where width of ducts and other construction within ceiling plenum produces hanger spacing that interferes with location of hangers at required spacing to support standard suspension system members:
  - .1 Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
- .3 Rigidly secure acoustic ceiling system including integral mechanical and electrical components with maximum deflection of L/360 to ASTM C635 deflection test.

#### 1.6 Performance Requirements

- .1 Seismic Performance: Acoustical ceiling shall withstand the effects of earthquake motions determined according to applicable code.

#### 1.7 Quality Assurance

- .1 Single-Source Responsibility: Provide acoustical panel units and grid components by a single manufacturer.
- .2 Fire Performance Characteristics: Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting organization.
  - .1 Surface Burning Characteristics: Tested per ASTM E84 and complying with ASTM E1264 Classification.
- .3 Coordination of Work: Coordinate acoustical ceiling work with installers of related work including, but not limited to building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.
- .4 Where required, provide fire-resistance rated suspension system: certified by a Canadian Certification Organization accredited by Standards Council of Canada.
- .5 Construct mock-ups in accordance with Section 01 45 00 - Quality Control and as described in Section 09 51 13.

#### 1.8 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.

#### 1.9 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

### PART 2 PRODUCTS

#### 2.1 Materials

- .1 Components: All main beams and cross tees, base metal and end detail shall be commercial quality hot-dipped galvanized steel as per ASTM C635. Main beams and cross tees shall be double-web steel construction with type exposed flange design. Exposed surfaces chemically cleansed, capping pre-finished galvanized steel in baked polyester paint. Main beams and cross tees shall have rotary stitching.

- .2 Face width: 22 mm
- .3 Edge Moldings and Trim: Hemmed angle moulding to match main beams and cross tees.
- .4 Structural Classification: Intermediate Duty System, ASTM C635.
- .5 Colour: White and match the actual colour of the specified ceiling tile.
- .6 Standard of Acceptance:
  - .1 Armstrong Prelude XL
  - .2 Donn DXT
  - .3 Certainteed Classic Environmental Stab.
- .7 Attachment Devices: Size for five times design load indicated in ASTM C635, Table 1, Direct Hung unless otherwise indicated or required.
- .8 Threaded Rod: to ASTM A397. Galvanized or zinc plated.
- .9 Wire for Hangers and Ties: ASTM A641, Class 1 zinc coating, soft annealed, with a yield stress load of at least three times design load, but not less than 2.06 mm thick.
- .10 Channel Framing and Fittings: Strut type metal framing and components to ASTM A1011 or ASTM A653. Unistrut P1000SL or equivalent. Galvanized.

### PART 3 EXECUTION

#### 3.1 Manufacturer's Instructions

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

#### 3.2 Examination

- .1 Do not proceed with installation until all wet work such as concrete, plastering and painting has been completed and thoroughly dried out, unless expressly permitted by manufacturer's printed recommendations.

#### 3.3 Preparation

- .1 Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders and comply with reflected ceiling plans. Coordinate panel layout with mechanical and electrical fixtures.
- .2 Coordination: Furnish layouts for preset inserts, clips, and other ceiling anchors whose installation is specified in other sections.
  - .1 Furnish concrete inserts and similar devices to other trades for installation well in advance of time needed for coordination of other work.

#### 3.4 Installation

- .1 Install suspension system and panels in compliance with ASTM C636; CISCA Seismic Guidelines and in accordance with the manufacturer's installation instructions.

- .2 Install wall moldings at intersection of suspended ceiling and vertical surfaces.
- .3 Do not erect ceiling suspension system until work above ceiling has been inspected by Consultant.
- .4 Secure hangers to overhead structure using attachment methods as indicated by manufacturer. Do not suspend ceiling systems from building services including plumbing lines, conduit, cable trays or duct work.
- .5 Hanger and bracing wires shall not attach to or bend around obstructions including but not limited to: piping, ductwork, conduit and equipment. Provide trapeze or other supplementary support members at obstructions to allow typical hanger spacing. Brace assemblies must be configured and/or located in order to avoid obstructions in addition to maintaining the required brace assembly spacing.
- .6 Install hangers spaced at maximum 1219 mm centres and within 152 mm from ends of main tees. Install hanger wires plumb and straight.
- .7 Lay out centre line of ceiling both ways, to provide balanced borders at room perimeter with border units not less than 50% of standard unit width.
- .8 Ensure suspension system is coordinated with location of related components.
- .9 Completed suspension system to support super-imposed loads, such as lighting fixtures, diffusers, grilles, and speakers.
- .10 Support at light fixtures and diffusers with additional ceiling suspension hangers within 150 mm of each corner and at maximum 610 mm around perimeter of fixture.
- .11 Interlock cross member to main runner to provide rigid assembly.
- .12 Frame at openings for light fixtures, air diffusers, speakers and at changes in ceiling heights.
- .13 Install access splines to provide ceiling access.
- .14 Finished ceiling system to be square with adjoining walls and level within 1:1000

### 3.5 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.
- .2 Touch up scratches, abrasions, voids and other defects in painted surfaces.

End of Section

## PART 1 GENERAL

### 1.1 General

- .1 Conform to the requirements of Division 1.

### 1.2 Related Sections

- .1 Section 03 30 00 Cast-in-Place Concrete
- .2 Section 09 65 19 Resilient Flooring

### 1.3 References

- .1 ASTM International (ASTM)
  - .1 ASTM A182/A182M-23 Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service
  - .2 ASTM A193/A193M-23 Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications
  - .3 ASTM A276/A276M-17 Standard Specification for Stainless Steel Bars and Shapes
  - .4 ASTM A313/A313M-18 Standard Specification for Stainless Steel Spring Wire
  - .5 ASTM A314-19 Standard Specification for Stainless Steel Billets and Bars for Forging
  - .6 ASTM A320/A320M-22a Standard Specification for Alloy-Steel and Stainless Steel Bolting for Low-Temperature Service
  - .7 ASTM A479/A479M-23a Standard Specification for Stainless Steel Bars and Shapes for Use in Boilers and Other Pressure Vessels
  - .8 ASTM A493-16 Standard Specification for Stainless Steel Wire and Wire Rods for Cold Heading and Cold Forging
  - .9 ASTM A580/A580M-23 Standard Specification for Stainless Steel Wire
  - .10 ASTM B117-19 Standard Practice for Operating Salt Spray (Fog) Apparatus
  - .11 ASTM C501-21 Standard Test Method for Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abraser
  - .12 ASTM C1028 – 07e1 Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method
  - .13 ASTM D543-21 Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents
  - .14 ASTM D2486-17 Standard Test Methods for Scrub Resistance of Wall Paints
- .2 American Association of State and Highway Transportation Officials (AASHTO)
  - .1 AASHTO HB-17 Standard Specifications for Highway Bridges
- .3 Accessibility for Ontarians with Disabilities Act (AODA)

### 1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Product Data: Submit manufacturer's literature describing products, installation procedures and maintenance instructions.
- .3 Samples for Verification Purposes: Submit two (2) full size sample of the kind proposed for use. Samples shall be properly labeled and shall contain the following information: Manufacturer's Name, and Catalog Number.
- .4 Shop Drawings: Submit shop drawings showing all pertinent characteristics and installation details.

- .5 Provide maintenance data for Stainless Steel Detectable Tactile Warning Surfaces for incorporation into Operating and Maintenance Manuals specified in Section 01 78 00.

#### 1.5 Quality Assurance

- .1 Provide Stainless Steel Detectable Warning Surface Domes and accessories as produced by a single manufacturer with a minimum of three (3) years' experience.
- .2 Installer's Qualifications: Engage an experienced installer who has successfully completed installations similar in material, design, and extent to that indicated for project.
- .3 Provide Stainless Steel Detectable Warning Surface Domes which are in compliance with:
  - .1 Accessibility for Ontarians with Disabilities Act (AODA)
  - .2 Americans with Disabilities Act

#### 1.6 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Stainless Steel Detectable Warning Surface Dome shall be suitably packaged or crated to prevent damage in shipment or handling. Finished surfaces shall be protected by sturdy wrappings.

#### 1.7 Project Conditions

- .1 Maintain a suitable temperature as per manufacturer's requirements.

#### 1.8 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

#### 1.9 Warranty

- .1 Warrant the work of this Section against defects of workmanship and material, for a period of five years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

### PART 2 PRODUCTS

#### 2.1 Manufacturer

- .1 Available manufacturers, subject to compliance with these Specifications include, but are not limited to, the following:
  - .1 Advantage Tactile Systems Inc. (1-800-679-4022) or approved equal.

#### 2.2 Materials

- .1 Stainless Steel Detectable Warning Surface Domes is based upon "Advantage One Tactile Dome Systems" with anti-slip design as manufactured by Advantage Tactile Systems Inc.
- .2 Existing engineered and field tested products which have been in successful service for a period of three years, and are subject to compliance with requirements, may be incorporated in the work provided they meet or exceed the specified test criteria and characteristics.

- .3 Stainless Steel Detectable Warning Surface Domes shall be manufactured from 316L Marine Grade stainless steel and have an integral non-slip surface on the top of the Domes. The Domes shall have measurements of nominal 5.08 mm in height, 22.8 mm base diameter and 11.43 mm top diameter with a concentric ring pattern.
- .4 Stainless Steel Detectable Warning Surface Domes material shall meet the following ASTM specifications: A182, A193, A276, A313, A314, A320, A479, A493 and A580.
  - .1 Chemical properties shall be: C 0.08%, Cr 17%, Fe 65%, Mn 2%, Mo 2.5%, Ni 12%, P 0.045%, S 0.03%, Si 1%.
  - .2 Mechanical properties shall be:
    - .1 Tensile Strength > 79,800 psi,
    - .2 Yield Strength > 34,800 psi,
    - .3 Elongation at Break (in 50 mm) > 60%,
    - .4 Rockwell B Hardness < 80,
    - .5 Brinell Hardness < 149,
    - .6 Izod Impact > 95.1 ft-lb.
  - .3 Slip Resistance when tested by ASTM C1028 the combined Wet and Dry Static Coefficient of Friction not to be less than 0.80 on top of domes.
  - .4 Chemical Stain Resistance when tested by ASTM D543 to withstand without discolouration or staining - saturated calcium chloride, red enamel spray paint, red lipstick, red wax crayon, black liquid ink, chewing gum, mustard, ketchup, urine, coffee, asphalt, tobacco juice, hydraulic oil and used motor oil.
  - .5 Abrasive Wear when tested by BYK – Gardener Tester ASTM D2486 with reciprocating linear motion of 37± cycles per minute over a 10" travel. The abrasive medium, a 40 grit Norton Metallite sandpaper, to be fixed and leveled to a holder. The combined mass of sled, weight and wood block is to be 3.2 lb. Average wear depth shall not exceed 0.04" after 1,000 abrasion cycles when measured on the top surface of the dome representing the average of three measurement locations per sample.
  - .6 Abrasive Wear when tested by Taber Tester ASTM C501 and US Specifications SS-T308b with H22 coarse Calibrate Wheels with each testing coupon weighed to the nearest 0.01 gram. Average wear index shall be a minimum of 480 after 1,000 abrasion cycles with ASTM C 501-84 parameters and 210 with SS-T-308b parameters when measured on the top surface of the dome representing the average of four sample measurements.
  - .7 Salt and Spray Performance when tested to ASTM B117 not to show any deterioration or other defects after 100 hours of exposure.
  - .8 AASHTO HB-17 single wheel HS20-44 loading. The Directional Tactile Detectable Warning Tactile Domes shall be mounted on a platform and subjected to the specified maximum load of 10,400 lbs., corresponding to an 8,000 lb individual wheel load and a 30% impact factor. The domes shall exhibit no visible damage at the maximum load of 10,400 lbs.
- .5 Adhesive: as recommended by manufacturer.

### **PART 3 EXECUTION**

#### **3.1 Installation**

- .1 Select correct drill bit size for peg diameter of dome. Ensure correct drill bit for corresponding surface/substrate. Mark drill bit to gauge depth or add a depth limiter which corresponds to overall peg length. Do not measure from tip of drill bit. This will allow dome hole to be slightly deeper than the length of the peg.
- .2 Lay the template down on working surface. Check alignment of holes, holes shall be centered in field of work. Use weights/pressure to help secure template on surface while drilling first hole.

Use a dowel and insert in newly drilled hole to secure the template. Repeat same procedure to opposite corner.

- .3 Drill out remaining holes in template as needed. Move template through field of work using pegs to align template with previous drilled holes.
- .4 Clean loose debris from holes, using shop vac or similar means that suits your surface/substrate.
- .5 Inject adhesive into drilled holes. Do not over fill holes. Once Stainless Steel Detectable Warning Surface Domes are inserted and if adhesive spills out, clean immediately with appropriate manufactures recommended cleaning agent.
- .6 Refer to the adhesive manufacturer's installation instructions for correct guidelines for adhesive.

### 3.2 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

## PART 1 GENERAL

### 1.1 General

- .1 Conform to the requirements of Division 1.

### 1.2 Related Sections

- .1 Section 03 30 00 Cast-in-Place Concrete
- .2 Section 09 65 66 Indoor Athletic Surfacing
- .3 Section 09 68 13 Carpet Tile

### 1.3 References

- .1 ASTM International (ASTM)
  - .1 ASTM E84-23c Standard Test Method for Surface Burning Characteristics of Building Materials
  - .2 ASTM F710-21 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
  - .3 ASTM F1066-04(2018) Standard Specification for Vinyl Composition Floor Tile
  - .4 ASTM F1344-21a Standard Specification for Rubber Floor Tile
  - .5 ASTM F1861-21 Standard Specification for Resilient Wall Base
- .2 Underwriters Laboratories of Canada (ULC)
  - .1 ULC 102.2-2018 Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies
- .3 South Coast Air Quality Management District (SCAQMD), California State
  - .1 SCAQMD Rule 1168-03, Adhesives and Sealants Applications.

### 1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit duplicate samples of manufacturer's full range of colours for specified products for selection of colours by the Consultant.
- .3 Submit a complete list of all materials proposed to be furnished and installed under this portion of the Work, stating manufacturer's name and catalogue number for each item, and product samples in colours specified.
  - .1 Submit two copies of the manufacturer's current recommended method of installation for each item.
- .4 Provide maintenance data for resilient flooring for incorporation into Operation and Maintenance Manual specified in Section 01 78 00 – Closeout Submittals.

### 1.5 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.
- .3 Use all means necessary to protect resilient flooring materials before, during and after installation and to protect the installed work and materials of all other trades.

1.6 Maintenance Materials

- .1 Provide extra stock materials of resilient flooring, base and adhesives in accordance with Section 01 78 00 – Closeout Submittals.
  - .1 Provide one carton of each colour, pattern and type flooring material required for this project for maintenance use.
  - .2 Provide one container of adhesive.
  - .3 Clearly identify each container of floor tile and each container of adhesive.
- .2 Extra materials to be from same production run as installed materials.

1.7 Environmental Requirements

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

1.8 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

1.9 Warranty

- .1 Warrant the work of this Section against defects of workmanship and material, for a period of ten years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

**PART 2 PRODUCTS**

2.1 Materials

- .1 Luxury Vinyl Tile: to CSA A126.1 or ASTM F1066, 305 x 305 x 3.0 mm thick, non-asbestos, Class 2 through pattern tile with static load of not less than 517 kPa and U.L.C. flame spread rating of 75 or less.
  - .1 Tarkett Event Wood Heritage Plank EHP 11222 Windsor 6x48
- .2 Resilient Base: To ASTM F1861, thermoplastic rubber, not less than 3.0 mm thickness with preformed internal and external corners. Base at resilient tile shall have standard toe.
  - .1 Johnsonite Mandalay 4 ½" MW-XX-H, Black 40
- .3 Rubber Tactile Warning Surface:
  - .1 Tactile Warning Tile (Attention Tile) Rubber Tiles (TW1): 4.0 mm dome height with 3.2 mm base thickness; 7.2 mm overall thickness.
  - .2 Meets current ISO/FDIS 23599 Assistive Products for the Blind & Vision-Impaired, Ontario Regulation 332/12, and Accessibility for Ontarians with Disabilities Act (AODA)
  - .3 Solid rubber floor tile to ASTM F1344.
  - .4 Hardness ASTM D2240: Not Less than 85 Shore A
  - .5 Slip resistance ASTM D2047 SCOF ≥ 0.6
  - .6 Smoke Generation ASTM E662 < 450
  - .7 Johnsonite Tactile Warning Tile – Rubber

- .4 Primers, Adhesives and Caulking: non-flammable, solvent free, waterproof, recommended by flooring manufacturer for specific material on applicable substrate, above, at or below grade.
- .5 Sub-floor filler and leveler shall be white premixed latex compatible with flooring products and adhesive as recommended by flooring manufacturer for specific flooring types.
- .6 Metal edge strips: aluminum extruded, smooth, mill finish with lip to extend under floor finish, shoulder flush with top of adjacent floor finish.
- .7 Transition strips, mouldings and adaptors shall be rubber or vinyl, manufactured by Johnsonite, Roppe or Burke Mercer with lip to extend under floor tile with tapered edge, colour matched to flooring.
- .8 Sealer: water based, type recommended by flooring manufacturer.
- .9 Wax: type recommended by flooring manufacturer.
- .10 All colours and patterns shall be as selected by the Consultant from the complete range of manufacturer's colours and patterns.

### **PART 3 EXECUTION**

#### **3.1 Surface Conditions**

- .1 Conform to requirements of ASTM F710.
- .2 Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
- .3 Confirm that resilient flooring and base may be installed in accordance with the original design and the manufacturer's recommendations.
- .4 Ensure concrete floors are dry, by using test methods recommended by tile manufacturer. Concrete must be cured a minimum of 35 days prior to commencement of resilient flooring application.
- .5 In the event of discrepancy, immediately notify the Consultant. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.
- .6 Perform subfloor moisture testing in accordance with ASTM F1869 and Bond Tests as described in manufacturer's installation guidelines to determine if surfaces are dry; free of curing and hardening compounds, old adhesive, and other coatings; and ready to receive flooring. Relative humidity shall not exceed 80%. MVER shall not exceed 5 lbs./1000 sq. ft./24 hrs. On installations where both the Percent Relative Humidity and the Moisture Vapor Emission Rate tests are conducted, results for both tests shall comply with the allowable limits listed above. Do not proceed with flooring installation until results of moisture tests are acceptable. All test results shall be documented and retained.

#### **3.2 Sub Floor Treatment**

- .1 Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.

- .2 Install sub floor and levelling compound to manufacturer's recommended standard limits and deviations. Levelling compound shall be applied to all subfloors and shall meet flatness requirements of flooring manufacturer and in accordance with ASTM F710.
- .3 Remove all substance and materials affecting adhesive bond.
- .4 Vacuum clean floors.
- .5 Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler is cured and dry.
- .6 Prime or seal substrates to flooring and adhesive manufacturer's instructions.
- .7 Allow for excessive leveling of existing slabs.

### 3.3 Application

- .1 Provide a high ventilation rate, with maximum outside air, during installation, and for 48 hours after installation. Whenever possible, ventilate directly to outside. Do not allow contaminated air to re-circulate through the building ventilation system.
- .2 Install all resilient flooring in strict accordance with the manufacturer's printed instructions and recommendations.
- .3 Do not lay floor coverings and base until all trades, except painter, have completed their work and just prior to completion of the building.
- .4 Apply adhesive uniformly with recommended trowels, at coverage as recommended by the manufacturer. Do not spread more adhesive than can be covered before initial set takes place.
- .5 Lay flooring with joints parallel to building lines unless otherwise indicated, to produce symmetrical tile pattern. Patterns shall be as directed by the consultant. Allow for one field tile and one accent tile in each room or space. Border tiles shall be minimum ½ tile width.
- .6 Install flooring to square grid pattern with all joints aligned unless otherwise indicated.
- .7 As installation progresses, and after installation, roll flooring in 2 directions with a 45 kg roller to ensure full adhesion.
- .8 Cut and fit tile neatly around fixed objects.
- .9 Install feature strips or feature tiles where directed. Fit joints tightly.
- .10 Continue flooring throughout areas to receive movable type partitions or fitments without interrupting floor pattern.
- .11 Install flooring full depth of closets, toe spaces, and recesses.
- .12 Terminate flooring at centre line of door in openings where adjacent floor finish or colour is dissimilar.

- .13 Install transition strips at unprotected or exposed edges where flooring terminates. Locate transition strip at centre line of door where a door occurs.

### 3.4 Tactile Warning Tile Installation

- .1 Install in accordance with manufacturer's instructions.

### 3.5 Base Application

- .1 Lay out base to keep number of joints to a minimum. Locate joints at maximum available spacing or at internal or pre moulded corners.
- .2 Clean substrate and prime with one coat of adhesive.
- .3 Apply adhesive to back of base.
- .4 Set base against wall and floor surfaces tightly by using a 3 kg hand roller.
- .5 Install straight and level to variation of 1:1000.
- .6 Scribe and fit to door frames and other obstructions. Use pre-moulded end pieces at flush door frames.
- .7 Cope internal corners. Use pre moulded corner units for right angle external corners. Use formed straight base materials for external corners of other angles, minimum 300 mm each leg.
- .8 Provide rubber base at all locations specified, regardless of floor finish.

### 3.6 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.
- .2 Remove excess adhesive from resilient floor coverings, base and adjacent finished surfaces as the work progresses.
- .3 Clean, seal and wax floor and base surfaces to manufacturer's instructions. In carpeted areas, clean base before installation of carpet.

### 3.7 Protection

- .1 Protect new floors until time of final inspection.
- .2 Prohibit traffic on floors for 48 hours after installation.
- .3 Immediately prior to final inspection, remove protection, clean, dry or damp mop resilient flooring and apply one additional coat of wax.

End of Section

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## PART 1 GENERAL

### 1.1 General

- .1 Conform to the requirements of Division 1.

### 1.2 Related Sections

- .1 Section 07 92 00 Joint Sealants
- .2 Section 09 65 19 Resilient Flooring
- .3 Section 09 69 00 Access Flooring

### 1.3 References

- .1 ASTM International (ASTM)
  - .1 ASTM D2859-16(2021) Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials
  - .2 ASTM E662-21ae1 Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials
  - .3 ASTM E648-19ae1 Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source
  - .4 ASTM F710-22 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
  - .5 ASTM F1869-22 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
  - .6 ASTM F2170-19a Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-4.129-93 Carpet for Commercial Use
  - .2 CAN/CGSB-4-GP-156 Direct Glue-Down Carpet, Guide to Selection and Installation
- .3 Carpet and Rug Institute (CRI)
  - .1 CRI 104-2002 Standard for Installation of Commercial Carpet
  - .2 CRI Indoor Air Quality Carpet Testing Program
- .4 American Association of Textile Chemists and Colorists (AATCC)
  - .1 AATCC 16-E Color Fastness to Lightfastness
  - .2 AATCC -134 under 3.5KV; Electrostatic Propensity of Carpet
- .5 Underwriters Laboratories of Canada (ULC)
  - .1 ULC 102.2 -2018 Method of Test for Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials and Assemblies.

### 1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Samples: Submit duplicate 610 mm square pieces of full line of each type of carpet tile specified for selection of colours by the Consultant.
- .3 Submit carpet layout with a complete list of all materials proposed to Consultant for review prior to start of work.
- .4 Submit manufacturer's current recommended method of installation for each item.

- .5 Provide maintenance data for carpet tile for incorporation into Operating and Maintenance Manuals specified in Section 01 78 00- Closeout Submittals.

1.5 Quality Assurance

- .1 Flooring contractor shall be approved by the material manufacturer and shall have completed a minimum of three projects of similar scope.

1.6 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.
- .3 Use all means necessary to protect carpet materials before, during and after installation and to protect the installed work and materials of all other trades.
- .4 In the event of damage, immediately make all repairs and replacements necessary to the approval of the Consultant and at no additional cost to the Owner.

1.7 Project Conditions

- .1 The temperature of the job site must stay within 15 °C and 25 °C throughout the installation and for 2-3 days beforehand.

1.8 Maintenance Materials

- .1 Submit in accordance with Section 01 78 00.
- .2 Provide extra materials as described below. Extra materials to be packaged with protective covering for storage. Identify extra materials with labels describing contents.
- .3 Extra Stock: Provide full size units equal to one carton of each type, colour and pattern required. Store on site as directed.
- .4 Maintenance materials to be from the same product run as installation materials.

1.9 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

1.10 Warranty

- .1 Warrant the work of this Section against defects of workmanship and material, for a period of two years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

**PART 2 PRODUCTS**

2.1 Materials

- .1 Carpet Tile: Modular, Class 2 through pattern tile.
  - .1 Basis of specification and standard of acceptance: Mohawk Group:

- .1 CPT1: Mohawk Fractal Fluency Square D 12x36/2
- .2 Design
  - .1 Size 12" x 36"
  - .2 Surface Appearance Level Patterned Loop
  - .3 Fiber Type Duracolor Tricor Premium Nylon
  - .4 Dye Method Solution Dyed
  - .5 Installation Method: Brick Ashlar
  - .6 Colour: 839 Flax
- .3 Performance
  - .1 Construction Tufted
  - .2 Gauge 1/12" (47.00 rows per 10cm)
  - .3 Stain Release Technology Permanent, Built into the Fiber
  - .4 Soil Release Technology EcoSentry Soil Protection
  - .5 Backing Material EcoFlex ONE
  - .6 Flammability ASTM E 648 - Class 1 (Glue Down)
  - .7 Smoke Density ASTM E 662 - Less than 450
  - .8 Static Propensity AATCC - 134 Under 3.5 KV
- .2 Accessories:
  - .1 Trim & Accessories: Finercraft Plastic Products Inc.
  - .2 Rubber Base: as specified in Section 09 65 19.
  - .3 Carpet Protection: Non-staining, heavy duty Kraft paper or 6 mil thick polyethylene film.
- .3 Leveling and Patching Compounds: Portland cement-based formulation provided by or recommended by carpet tile manufacturer. Do not use gypsum based compounds.
- .4 Adhesive: Pressure Sensitive Adhesive or as recommended by manufacturer.
- .5 All products shall meet the flame spread and smoke developed criteria under ULC 102.2.

### PART 3 EXECUTION

#### 3.1 Inspection

- .1 The labels on each carton shall indicate product style, pattern, colour, run number and dye lot. Confirm that the style, pattern and colour match the specifications for each area of installation. Do not mix run numbers or dye lots on the same area.

#### 3.2 Surface Conditions

- .1 Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
- .2 Confirm that carpet tile may be installed in accordance with the original design and the manufacturer's recommendations.
- .3 In the event of discrepancy, immediately notify the Consultant.
- .4 Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.
- .5 Concrete Subfloors: Verify that concrete slabs comply with the following:

- .1 Prepare concrete subfloors in accordance with ASTM F710.
- .2 Concrete floors must be thoroughly cured (minimum 90 days) prior to tile installation.
- .3 Remove coatings, including curing compounds, existing floor covering adhesive residues, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by the carpet manufacturer.
- .4 Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by the carpet manufacturer.
- .5 Test the moisture emission and alkalinity levels of the concrete as per manufacturer's instructions and referenced standards.
- .6 Use leveling and patching compounds recommended by flooring manufacturer for filling cracks, holes and depressions in the substrate. Surface shall be smooth, level and at proper elevation. Remove ridges, roughness and protrusions from concrete surfaces by grinding.

### 3.3 Installation

- .1 Install all carpet tiles in strict accordance with the manufacturer's recommendations and written installation instructions and CRI 104, Section 14, "Carpet Modules".
- .2 Do not lay carpet tiles until all trades, except painter, have completed their work and just prior to completion of the building.
- .3 Install carpet tile using a minimum number of pieces of carpet tile.
- .4 Fill all cavities, cracks, joints and all other surface imperfections in concrete substrate with latex fill or other approved subfloor filler in order to produce a smooth, flat, hard surface for receipt of carpet tile. Scrape off all ridges, droppings, scale and other projections. Clean floor with an industrial vacuum cleaner. Remove all substance and materials affecting adhesive bond.
- .5 Install carpet tile pattern parallel to walls and borders
- .6 Dry fit (without adhesive) tiles along the entire length of vertical and horizontal centre lines. Make necessary adjustments prior to commencing installation.
- .7 Provide full coverage spread of specified release adhesive. Protect all elements and baseboards with plastic or other material before spraying. Apply adhesive in accordance to manufacturer's recommendations.
- .8 Lay tiles in the step or pyramid pattern in accordance to manufacturer's recommendations.
- .9 Tiles adjacent to fixtures, architectural elements and walls shall be cut. Follow the manufacturer's guidelines. Where tiles terminate at doorways, or where tiles of different type or colour butt together the joint shall centre on the door. Provide and install reducer strips where carpet tiles terminate against a concrete floor where no applied architectural floor finish is required. Reducer strip shall be installed below centre of door where a door occurs.
- .10 Lay tiles with all joints square and tightly butted together. Start installation from centre of rooms to ensure equal maximum size edge tiles. Pattern and direction of tile shall be as directed by the Consultant.

- .11 Lay tiles at full depth of closets, toe spaces, and recesses. Cut and fit tiles tightly against openings, breaks, frames, fixtures, columns and other vertical surfaces. Apply adhesive to provide watertight joint around all cut areas.
- .12 Roll carpet tile for complete contact of carpet tile with adhesive and substrate.
- .13 Resilient base shall be installed under Section 09 65 19.

### 3.4 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.
- .2 Perform cleaning operations immediately after installing carpet.
- .3 Inspect the entire installation, paying close attention to joint and any tiles that have been cut.
- .4 Remove yarns that protrude from carpet surface
- .5 Remove surplus adhesive from carpet tiles as the work progresses.
- .6 Vacuum carpet using commercial machine with rotating brush.
- .7 Protect installed carpet to comply with CRI 104, Section 16 protection of indoor installations. Protect carpet and carpet tile against damage from construction
- .8 Immediately prior to Substantial Performance, remove protection and vacuum the floor with a pile lifter.

End of Section

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## PART 1 GENERAL

### 1.1 General

- .1 Conform to the requirements of Division 1.

### 1.2 Related Sections

- .1 Section 09 65 19 Resilient Tile Flooring
- .2 Section 09 68 13 Carpet Tile

### 1.3 References

- .1 ASTM International (ASTM)
  - .1 ASTM E84-23d Standard Test Method for Surface Burning Characteristics of Building Materials
- .2 National Fire Prevention Association (NFPA)
  - .1 NFPA 75 Standard for the Fire Protection of Information Technology Equipment
- .3 Ceilings & Interior Systems Construction Association (CISCA)
  - .1 Recommended Test Procedures for Access Floors.

### 1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit shop drawings:
  - .1 Indicate floor panel layout based on field verified dimensions, component details, anchorage methods, edge details, elevation differences, materials, finishes, fasteners and other data to permit a full evaluation of the entire access flooring system.
  - .2 Shop drawings shall be signed and sealed by a Professional Engineer.
- .3 Detail sheets, for each proposed product type, which provide the necessary information to describe the product and its performance.
- .4 Manufacturer's installation instructions and guidelines.
- .5 Samples: submit full size samples to indicate manufacturer's standard material and colour selections and shall consist of actual units showing full range of colours, textures and patterns.
- .6 Test reports, certified by an independent testing laboratory with a minimum of five years of experience testing access floor components in accordance CISCA Recommended Test Procedures, certifying that component parts perform as specified.
- .7 Provide maintenance data for access flooring for incorporation into Operating and Maintenance Manuals specified in Section 01 78 00- Closeout Submittals.

### 1.5 Definition

- .1 Access flooring shall mean a complete portable assembly of modular floor panels on an elevated support system (understructure) forming an accessible underfloor cavity to accommodate electrical and mechanical systems.

**1.6**      Quality Assurance

- .1 Structural components of the access flooring system shall be designed by a registered professional engineer, licensed to practice in the Province of Ontario, and qualified to provide engineering services of the type indicated which has resulted in the successful installation of systems similar to the type required for this project.
- .2 Installation of access floor only by experienced applicators authorized by manufacturer of system used.
- .3 Coordinate location of electrical and mechanical work in underfloor cavity to prevent interference with understructure.
- .4 Installer's qualifications: Perform Work of this Section by a company that has a minimum of five years proven experience in the installation of access flooring systems of a similar size and nature and that is approved by manufacturer. Submit to Owner, applicator's current certificate of approval by the material manufacturer as proof of compliance.
- .5 Mock-up:
  - .1 Construct one 2m<sup>2</sup> mock-up of access flooring system 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.
- .6 Pre-installation meetings: Arrange with manufacturer's representative, installation Subcontractor, and Consultant to inspect substrates, and to review installation procedures 48 hours in advance of installation.
- .7 Product tests shall be witnessed and certified by independent engineering and testing laboratory based in the U.S. with a minimum of five years of experience testing access floor components in accordance Cisca "Recommended Test Procedures for Access Floors".

**1.7**      Design Criteria

- .1 Access flooring system to comply with requirements of NFPA 75 and the Ontario Building Code.
- .2 Access floor system, where indicated on the design documents, shall consist of modular and removable steel clad woodcore panels supported by adjustable height support pedestal assemblies with bolted (snap on) stringers.
- .3 Panel shall be easily removed by one person with a suction cup lifting device and shall be interchangeable except where cut for special conditions.

**1.8**      Performance Requirements

- .1 Design Load: Panel supported on actual understructure (the system) shall be capable of supporting a safe working load or design load of 453 kg. This rating signifies that the system will withstand not only a concentrated load placed on a 6.5 square cm area at any location on the

panel without yielding but also demonstrate the ability to withstand an overload capacity of two times its rating (i.e. a safety factor of 2).

- .2 Safety Factor: Panel supported on actual understructure (the system) shall be capable of withstanding a minimum of (2) two times the design load anywhere on the panel without failure. Failure is defined as the point at which the system will no longer accept the load.
- .3 Rolling Load: Panel supported on actual understructure (the system) shall be able to withstand the following rolling loads at any location on the panel without developing a local and overall surface deformation greater than 1 mm. Wheel 1 and wheel 2 tests shall be performed on two separate panels.
  - .1 Wheel 1: Size: 76 mm diameter x 46 mm wide Load: 453 kg. Passes: 10
  - .2 Wheel 2: Size: 150 mm diameter x 51 mm wide Load: 272 kg. Passes: 10,000
- .4 Impact Load: Panel supported on actual understructure (the system) shall be capable of supporting an impact load of 68 kg dropped from a height of 305 mm onto a 6.4 cm<sup>2</sup> area (using a round or square indenter) at any location on the panel.
- .5 Panel Drop Test: Panel shall be capable of being dropped face up onto to a concrete slab from a height of 915 mm, after which it shall continue to meet all load performance requirements as previously defined.
- .6 Panel Cutout: Panel with an 200 mm diameter interior cutout supported on actual understructure shall be capable of maintaining its design load strength anywhere on the panel without the use of additional supports.
- .7 Flammability: System shall meet Class A Flame spread requirements for flame spread and smoke development. Tests shall be performed in accordance with ASTM E84.
- .8 Axial Load: Pedestal support assembly shall provide a minimum 2,267 kg axial load without permanent deformation.
- .9 Overturning Moment: Pedestal support assembly shall provide an average overturning moment of 1000 in-lbs. when glued to a clean, sound, uncoated concrete surface. ICBO number for the specific system or structural calculations shall be required attesting to the lateral stability of the system under seismic conditions.
- .10 Stringer Concentrated Load: Stringer shall be capable of withstanding a concentrated load of 136 kg placed in its midspan on a one 6.5 cm square area using a round or square indenter without exceeding a permanent set of 0.254 mm after the load is removed.
- .11 Earthquake Load:
  - .1 Access flooring systems shall withstand stresses produced by lateral forces of magnitude indicated in geographic zone of installation.
- .12 Allowable Tolerances:
  - .1 Floor panel flatness: Plus or minus 0.5 mm in any direction.
  - .2 Floor panel surface dimension: Plus or minus 0.5 mm.
  - .3 Floor panel squareness: Plus or minus 0.5 mm in panel surface dimension and 0.25 mm measured diagonally.
- .13 Electrical resistance of system not to exceed 1 ohm measured across surface of bare panel to

understructure by test method as specified in Chapter 3 of NFPA 99.

**1.9**     Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.
- .3 Deliver access flooring components in original, unbroken containers, clearly labeled with manufacturer's name and item description, product identification, and country-of-origin.
- .4 Handle and store packages containing access flooring material as directed by the manufacturer, and in a manner so as to not overload the structure.

**1.10**    Environmental Conditions

- .1 Area to receive and store access floor materials shall be enclosed and maintained at ambient temperatures between 2° to 35° C and relative humidity levels between 20 to 80%. All floor panels shall be stored at ambient temperatures between 10° to 32°C for at least 24 hours before installation begins. All areas of installation shall be enclosed and maintained at ambient temperature between 10° to 32° C and at relative humidity levels between 20% and 80% and shall remain within these environmental limits throughout occupancy.

**1.11**    Sequencing and Scheduling

- .1 Mark pedestal locations on concrete subfloor so that mechanical and electrical work can be installed without interfering with the pedestals.
- .2 Do not proceed with installation of access flooring until after the completion of other construction within affected spaces.

**1.12**    Maintenance Materials

- .1 Deliver four spare floor panels and one spare perforated panel and five spare pedestals with associated stringers and components for maintenance use. Spare materials shall be packaged and labeled. Store where directed.
- .2 Floor finish materials to be same production run as installed materials.

**1.13**    Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

**1.14**    Warranty

- .1 Warrant the work of this Section against defects of workmanship and material, for a period of three years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

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## PART 2 PRODUCTS

### 2.1 Manufacturer

- .1 Access floor system shall be manufactured by Tate Access Floors, Inc. 880 Equestrian Ct, Oakville, ON L6L 6L7; (905) 847-0138

### 2.2 Product

- .1 Access floor system shall be as manufactured by Tate Access Floors, Inc. and shall consist of ConCore 1250 access floor panel supported by a bolted stringer understructure system.

### 2.3 Support Components Pedestals

- .1 Pedestal assemblies shall be corrosive resistant, all steel welded construction, and shall provide an adjustment range of +/- 25 mm for finished floor heights 152 mm or greater.
- .2 Pedestal assemblies shall provide a means of leveling and locking the assembly at a selected height, which requires deliberate action to change height setting and prevents vibration displacement.
- .3 Hot dip galvanized steel pedestal head designed to accept a bolted (Snap) stringer grid shall be welded to a threaded rod which includes a specially designed adjusting nut. The nut shall provide location lugs to engage the pedestal base assembly, such that deliberate action is required to change the height setting.
- .4 Threaded rod shall provide a specially designed anti-rotation device, such that when the head assembly is engaged in the base assembly, the head cannot freely rotate (for FFH of 152 mm or greater).
- .5 Hot dip galvanized pedestal base assembly shall consist of a formed steel plate with no less than 400 mm of bearing area, welded to a 22 mm square steel tube and shall be designed to engage the head assembly.

### 2.4 Support Components Stringers

- .1 Manufacturer's modular steel stringer system, designed and fabricated to interlock with pedestal head and to form a grid pattern with members under each edge of each floor panel and with a pedestal under each corner of each floor panel. Protect steel components against corrosion with manufacturer's standard hot dipped galvanized finish.
- .2 Provide stringers that support each edge of each full panel where required to meet design load criteria. Gasket tape shall be factory applied to top surface of grid to provide a quiet sound absorbing seal.
  - .1 Bolt-on stringers: System of 610 mm stringers connected to pedestals with self-threading fasteners accessible from above. Grid shall be hot dipped galvanized steel and be capable of supporting a 1.33 kN point load at stringers center span, with a permanent set not to average more than 0.25mm.

### 2.5 Panel Components

- .1 Panels shall consist of a top steel sheet welded to a formed steel bottom pan filled internally with a lightweight cementitious material. Mechanical or adhesive methods for attachment of the steel top and bottom sheets are unacceptable.

- .2 Floor panels shall be protected from corrosion by electro-deposited epoxy paint. The use of zinc electroplating shall be prohibited. Panels shall have a flame spread rating of 25 or less for approval for use in non-combustible construction.
- .3 Cementitious fill material shall be totally encased within the steel welded shell except where cut for special conditions.
- .4 Finish Flooring: Carpet tile as specified in Sections 09 68 13.

## 2.6 Accessories

- .1 Provide manufacturer's standard ramps, fascia plate, perimeter support, and grommets where indicated on the contract drawings.
- .2 When applicable provide manufacturer's standard underfloor air systems components (including grilles and diffusers) where indicated on the contract drawings.
- .3 Panel lifting device: Manufacturers standard as recommended for each panel type.
- .4 Adhesives: Type as recommended by manufacturer of article to be bonded.
- .5 Trim to match finish of floor panels except where noted otherwise.

## 2.7 Fabrication Tolerances

- .1 Floor panel flatness measured on a diagonal: +/- 0.889mm
- .2 Floor panel flatness measured along edges: +/- 0.635mm
- .3 Floor panel width or length of required size: +/- 0.254mm
- .4 Floor panel squareness tolerance: +/- 0.381mm

## 2.8 Finishes

- .1 Finish the surface of floor panels with floor covering material as indicated on the Contract Drawings.

# PART 3 EXECUTION

## 3.1 Manufacturer's Instructions

- .1 Install components to system manufacturer's instructions and under the supervision of the system manufacturer's authorized representative to ensure rigid, firm installation, free from vibration, rocking, rattle, squeaks and other unacceptable performance.

## 3.2 Examination

- .1 Verify substrate surfaces are solid, free from moisture, dust, oil, grease, scaling or laitance, projections and any other foreign matter detrimental to performance.
- .2 Ensure area to receive access flooring is square. If area is out of square, layout work in such a way that perimeter panels are cut to fit and follow configuration of abutting vertical surface. Filling

squareness differential with strips of access floor material is not acceptable.

- .3 Examine structural subfloor for unevenness, irregularities and dampness that would affect the quality and execution of the work. Do not proceed with installation until structural floor surfaces are level, clean, and dry as completed by others.
- .4 Concrete sealers, if used, shall be identified and proven to be compatible with pedestal adhesive. Verify that adhesive achieves bond to slab before commencing work.
- .5 Verify dimensions on contract drawings, including level of interfaces including abutting floor, ledges and doorsills.

### 3.3 Installation

- .1 Pedestal locations shall be established from approved shop drawings so that mechanical and electrical work can be installed without interfering with pedestal installation.
- .2 Installation of access floor shall be coordinated with other trades to maintain the integrity of the installed system. All traffic on access floor shall be controlled by access floor installer. No traffic but that of access floor installers shall be permitted on any floor area for 24 hours to allow the pedestal adhesive to set. Access floor panels shall not be removed by other trades for 72 hours after their installation.
- .3 Floor system and accessories shall be installed under the supervision of the manufacturer's authorized representative and according to manufacturer's recommendations.
- .4 No dust or debris producing operations by other trades shall be allowed in areas where access floor is being installed to ensure proper bonding of pedestals to subfloor.
- .5 Access floor installer shall keep the subfloor broom clean as installation progresses.
- .6 Partially completed floors shall be braced against shifting to maintain the integrity of the installed system where required.
- .7 Additional pedestals as needed shall support panels where floor is disrupted by columns, walls, and perimeter cutouts.
- .8 Understructure shall be aligned such that all uncut panels are interchangeable and fit snugly but do not bind when placed in alternate positions.
- .9 Install floor panels and floor finish solidly on pedestals, level to maximum variation over entire floor of 1:2000.
- .10 Install metal channels to protect edges of all cut panels.
- .11 Inspect system prior to application of floor covering and replace any flooring panels that are cracked, broken and structurally damaged and do not comply with specified requirements.

### 3.4 Protection

- .1 Protect finished access floor from damage until time of Substantial Performance.

- .2 Prevent traffic over access floor areas, and protect finished floor with kraft paper, sealed at edges to prevent tearing.

### 3.5 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.
- .2 Clean finished floor free of dust and other surface contaminants. Clean area under floor completely. Remove debris and vacuum clean entire underfloor wall, floor, and supporting structure.
- .3 Prior to Substantial Performance, remove protection and dispose of same and leave floor in a clean condition, free from defects.

End of Section

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## PART 1 GENERAL

### 1.1 General

- .1 Conform to the requirements of Division 1.

### 1.2 Related Sections

- .1 Section 05 50 00 Metal Fabrications
- .2 Section 06 20 00 Finish Carpentry
- .3 Section 08 11 00 Metal Doors and Frames
- .4 Section 08 14 16 Flush Wood Doors
- .5 Section 09 21 16 Gypsum Board

### 1.3 References

- .1 ASTM International (ASTM)
  - .1 ASTM A780/A780M-20 Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
- .2 Environmental Protection Agency (EPA)
  - .1 Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 (for Surface Coatings).
- .3 Master Painters Institute (MPI)
  - .1 MPI Architectural Painting Specifications Manual, 2018
  - .2 MPI Standard GPS-1-12 and GPS-2-12 MPI Green Performance Standard for Painting and Coatings.
- .4 Society for Protective Coatings (SSPC)
  - .1 Systems and Specifications, SSPC Painting Manual 2009
- .5 Underwriters Laboratories of Canada (ULC)
  - .1 ULC 102-18 Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies
- .6 South Coast Air Quality Management District, California State (SCAQMD)
  - .1 SCAQMD Rule 1113-96, Architectural Coatings.
- .7 Green Seal GS-11 Green Seal Environmental Standard for Paints and Coatings, January 1997.
- .8 National Fire Code of Canada

### 1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Samples:
  - .1 Submit full range colour sample chips.
  - .2 Submit duplicate 200 x 300 mm sample panels of each paint, stain, clear coating and special finish with specified paint or coating in colours, gloss/sheen and textures required to MPI Architectural Painting Specification Manual standards.
  - .3 Retain reviewed samples on-site to demonstrate acceptable standard of quality for appropriate on-site surface.
- .4 Certificates: submit certificates signed by manufacturer certifying that materials comply with

specified performance characteristics and physical properties and SCAQMD Rule 1113-96.

- .5 Provide maintenance data for paint products for incorporation into Operating and Maintenance Manuals specified in Section 01 78 00- Closeout Submittals. Include following:
  - .1 Product name, number, type and use.
  - .2 Colour numbers.
  - .3 MPI Environmentally Friendly classification system rating.

#### 1.5 Quality Assurance

- .1 Qualifications:
  - .1 Contractor: to have a minimum of five years proven satisfactory experience.
  - .2 Qualified journeypersons as defined by local jurisdiction to be engaged in painting work.
  - .3 Apprentices: may be employed provided they work under direct supervision of qualified journeyperson in accordance with trade regulations.
- .2 Conform to latest MPI requirements for painting work including preparation and priming.
- .3 Materials: in accordance with MPI Painting Specification Manual "Approved Product" listing and from a single manufacturer for each system used.
- .4 Paint materials to be highest quality product of an approved manufacturer listed in MPI Painting Specification Manual and to be compatible with other coating materials as required.
- .5 Retain purchase orders, invoices and documents to prove conformance with noted MPI requirements when requested by Consultant.
- .6 Provide mock-up in accordance with Section 01 45 00 - Quality Control.
  - .1 Prepare and paint designated surface, area, room or item (in each colour scheme) to specified requirements, with specified paint or coating showing selected colours, gloss/sheen and textures. Locate where directed.
  - .2 Mock-up will be used to judge workmanship, substrate preparation, operation of equipment and material application and workmanship to MPI Architectural Painting Specification Manual standards.
  - .3 Allow 24 hours for inspection of mock-up before proceeding with work.
  - .4 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.

#### 1.6 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Deliver and store materials in original containers, sealed, with labels intact. Labels to indicate:
  - .1 Manufacturer's name and address.
  - .2 Type of paint or coating.
  - .3 Compliance with applicable standard.
  - .4 Colour number in accordance with established colour schedule.
- .3 Provide and maintain dry, temperature controlled, secure storage. Store materials and equipment in well-ventilated area with temperature range 7 ° C to 30 ° C. Store materials and supplies away from heat generating devices.
- .4 Observe manufacturer's recommendations for storage and handling.

- .5 Keep areas used for storage, cleaning and preparation, clean and orderly. After completion of operations, return areas to clean condition.
- .6 Remove paint materials from storage only in quantities required for same day use.
- .7 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.
- .8 Remove damaged, opened and rejected materials from site.

**1.7 Fire Safety Requirements**

- .1 Provide one 9 kg Type ABC dry chemical fire extinguisher adjacent to storage area.
- .2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
- .3 Handle, store, use and dispose of flammable and combustible materials in accordance with National Fire Code of Canada requirements.

**1.8 Waste Management and Disposal**

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.
- .2 Place materials defined as hazardous or toxic in designated containers. Handle and dispose of hazardous materials in accordance with Municipal regulations.
- .3 Unused materials must be disposed of at official hazardous material collections site.
- .4 Paint and related materials are regarded as hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from the Ministry of the Environment.
- .5 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.
- .6 Place materials defined as hazardous or toxic waste in containers or areas designated for hazardous waste.

**1.9 Maintenance**

- .1 Extra Materials:
  - .1 Submit maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
  - .2 Quantity: provide one four litre can of each type and colour of finish coating. Identify colour and paint type in relation to established colour schedule and finish system.
  - .3 Deliver to Owner and store where directed.

**1.10 Ambient Conditions**

- .1 Heating, Ventilation and Lighting:
  - .1 Ventilate enclosed spaces in accordance with Section 01 51 00 – Temporary Utilities.
  - .2 Provide heating facilities to maintain ambient air and substrate temperatures above 10 ° C for 24 hours before, during and after paint application until paint has cured sufficiently.

- .3 Provide continuous ventilation for seven days after completion of application of paint.
- .4 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.
- .5 Provide minimum lighting level of 323 Lux on surfaces to be painted.
- .2 Temperature, Humidity and Substrate Moisture Content Levels:
  - .1 Unless pre-approved in writing by Consultant and product manufacturer, perform no painting when:
    - .1 Ambient air and substrate temperatures are below 10 ° C.
    - .2 Substrate temperature is above 32 ° C unless paint is specifically formulated for application at high temperatures.
    - .3 Substrate and ambient air temperatures are not expected to fall within MPI or paint manufacturer's prescribed limits.
    - .4 The relative humidity is under 85% or when the dew point is more than 3 ° C variance between the air/surface temperature. Paint should not be applied if the dew point is less than 3 ° C below the ambient or surface temperature. Use sling psychrometer to establish the relative humidity before beginning paint work.
  - .2 Ensure that conditions are within specified limits during drying or curing process, until newly applied coating can itself withstand 'normal' adverse environmental factors.
  - .3 Perform painting work when maximum moisture content of the substrate is below:
    - .1 Allow new concrete to cure minimum of 28 days.
    - .2 15% for wood.
    - .3 12% for plaster and gypsum board.
  - .4 Test for moisture using calibrated electronic Moisture Meter. Test concrete floors for moisture using "cover patch test".
  - .5 Test concrete and plaster surfaces for alkalinity as required.
- .3 Surface and Environmental Conditions:
  - .1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
  - .2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits.
  - .3 Apply paint when previous coat of paint is dry or adequately cured.

## **PART 2 PRODUCTS**

### **2.1 Materials**

- .1 Provide paint materials for paint systems from single manufacturer.
- .2 Products to meet requirements of GS-11 or SCAQMD Rule 1113-96
- .3 Paint materials listed in the MPI Approved Products List (APL) are acceptable for use on this project.
- .4 Only qualified products with E2 or E3 "Environmentally Friendly" rating are acceptable for use.
- .5 Linseed oil, shellac, and turpentine: highest quality product from approved manufacturer listed in MPI Architectural Painting Specification Manual, compatible with other coating materials as required.
- .6 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids:

- .1 Non-flammable, biodegradable.
- .2 Manufactured without compounds which contribute to ozone depletion in the upper atmosphere.
- .3 Manufactured without compounds which contribute to smog in the lower atmosphere.
- .4 Do not contain methylene chloride, chlorinated hydrocarbons or toxic metal pigments.
- .5 Recycled content of 15% post-consumer and ½ post-industrial waste.
- .7 Formulate and manufacture water-borne surface coatings with no aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.
- .8 Flash point: 61 °C or greater for water-borne surface coatings and recycled water-borne surface coatings.

## 2.2 Colours

- .1 Consultant will provide Colour Schedule.
- .2 Colour schedule will be based upon selection of eight base colours and six deep tint accent colours.
- .3 Selection of colours will be from manufacturer's full range of colours.
- .4 Where specific products are available in restricted range of colours, selection will be based on limited range.
- .5 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

## 2.3 Mixing and Tinting

- .1 Perform colour tinting operations prior to delivery of paint to site.
- .2 Use and add thinner in accordance with paint manufacturer's recommendations. Do not use kerosene or similar organic solvents to thin water-based paints.
- .3 Thin paint for spraying in accordance with paint manufacturer's instructions.
- .4 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

## 2.4 Gloss/Sheen Ratings

- .1 Paint gloss: defined as sheen rating of applied paint, in accordance with following values:

Gloss Level Category/	Units @ 60 Degrees	Units @ 85 Degrees
G1 – matte finish	0 to 5	Max. 10
G2 – velvet finish	0 to 10	10 to 35
G3 – eggshell finish	10 to 25	10 to 35
G4 – satin finish	20 to 35	Min. 35
G5 – semi-gloss finish	35 to 70	
G6 – gloss finish	70 to 85	
G7 – high gloss finish	> 85	

- .2 Gloss level ratings of painted surfaces as specified and as noted on Finish Schedule.

## 2.5 Interior Painting Systems

- .1 Metal Fabrications:
  - .1 INT 5.3A Latex G5 semi-gloss finish
- .2 Galvanized Metal: interior doors, frames, railings, misc. steel, pipes, and ducts.
  - .1 INT 5.3A Latex G5 semi-gloss finish
- .3 Concrete Masonry:
  - .1 INT 4.2D High performance architectural latex G5 semi-gloss finish.
- .4 Wood Clear Polyurethane Finish (Wood doors):
  - .1 INT 6.3K Polyurethane varnish G6 gloss finish.
- .5 Gypsum Board: Walls:
  - .1 INT 9.2A Latex G3 eggshell finish over latex sealer.
- .6 Gypsum Board: Ceilings and Bulkheads:
  - .1 INT 9.2A Latex G2 velvet finish over latex sealer.
- .7 All other surfaces not noted above: high performance finish suitable for commercial and institutional environment and in accordance with MPI painting manual.

## PART 3 EXECUTION

### 3.1 General

- .1 Perform preparation and operations for interior painting in accordance with MPI Architectural Painting Specifications Manual except where specified otherwise.
- .2 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and application instructions, and data sheets.

### 3.2 Examination

- .1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report damages, defects, unsatisfactory or unfavourable conditions to Consultant before proceeding with work.

### 3.3 Preparation

- .1 Protection:
  - .1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking and in accordance with paint manufacturers and MPI recommendations. If damaged, clean and restore surfaces as directed by Consultant.
  - .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
  - .3 Protect factory finished products and equipment.
- .2 Surface Preparation:
  - .1 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.

- .2 Place "WET PAINT" signs in occupied areas as painting operations progress.
- .3 Clean and prepare surfaces in accordance with MPI Architectural Painting Specification Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:
  - .1 Remove dust, dirt, and other surface debris by vacuuming, wiping with dry, clean cloths, or compressed air.
  - .2 Wash surfaces with a biodegradable detergent and bleach where applicable and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
  - .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
  - .4 Allow surfaces to drain completely and allow to dry thoroughly.
  - .5 Prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.
  - .6 Use trigger operated spray nozzles for water hoses.
  - .7 Many water-based paints cannot be removed with water once dried. Minimize use of mineral spirits or organic solvents to clean up water-based paints.
- .4 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.
- .5 Where possible, prime non-exposed surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.
  - .1 Apply vinyl sealer to MPI #36 over knots, pitch, sap and resinous areas.
  - .2 Apply wood filler to nail holes and cracks.
  - .3 Tint filler to match stains for stained woodwork.
- .6 Clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements and SSPC-SP 6. Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes blowing with clean dry compressed air or vacuum cleaning.
- .7 Touch up of shop primers with primer as specified.
- .8 Do not apply paint until prepared surfaces have been accepted by Consultant.

### 3.4 Application

- .1 Apply paint materials in accordance with paint manufacturer's written application instructions.
- .2 Brush and Roller Application:
  - .1 Apply paint in uniform layer using brush and/or roller type suitable for application.
  - .2 Work paint into cracks, crevices and corners.
  - .3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
  - .4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces free of roller tracking and heavy stipple.
  - .5 Remove runs, sags and brush marks from finished work and repaint.
- .3 Spray application:
  - .1 Provide and maintain equipment that is suitable for intended purpose, capable of atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
  - .2 Keep paint ingredients properly mixed in containers during paint application either by

- continuous mechanical agitation or by intermittent agitation as frequently as necessary.
- .3 Apply paint in uniform layer, overlapping at edges of spray pattern. Back roll first coat application.
  - .4 Brush out immediately all runs and sags.
  - .5 Use brushes and rollers to work paint into cracks, crevices and places which are not adequately painted by spray.
- .4 Apply coats of paint continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
  - .5 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
  - .6 Sand and dust between coats to remove visible defects.
  - .7 Finish surfaces both above and below sight lines as specified for surrounding surfaces.
  - .8 Finish alcoves as specified for adjoining rooms.
  - .9 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

### 3.5 Mechanical/Electrical Equipment

- .1 Paint finished area exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and finish to match adjacent surfaces.
- .2 Mechanical and electrical rooms: paint exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment.
- .3 Other unfinished areas: leave exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish and touch up scratches and marks.
- .4 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.
- .5 Do not paint over nameplates.
- .6 Keep sprinkler heads free of paint.
- .7 Paint inside of ductwork where visible behind grilles, registers and diffusers with primer and one coat of matt black paint.
- .8 Paint fire protection piping red.
- .9 Paint natural gas piping yellow.
- .10 Paint both sides and edges of backboards for telephone and electrical equipment before installation. Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.
- .11 Do not paint interior transformers and substation equipment.

**3.6**     Field Quality Control

- .1 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
- .2 Standard of Acceptance:
  - .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
  - .2 Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
  - .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

**3.7**     Cleaning and Restoration

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.
- .2 Remove protective coverings and warning signs as soon as practical after operations cease.
- .3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.
- .4 Protect freshly completed surfaces from paint droppings and dust to approval of Consultant. Avoid scuffing newly applied paint.
- .5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Consultant.

End of SectCon