

# PROJECT MANUAL (SPECIFICATIONS)

SHSC C2 Decant (K3E) and GIM Decant (K2E)  
2075 Bayview Ave  
North York, ON

2025-11-20

Issued For: Tender

Volume 1 – Division 00 - 13

NORR  
175 Bloor St E 15th Floor,  
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Project No.: HS1024-0383

**PART 1      PROJECT TEAM**

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END OF SECTION

The following professional seals and signatures are provided as required by the Building Code for the above Project and apply to documents prepared under the supervision of the following registered professionals as identified on the Project Manual table of contents.

ARCHITECTURAL (A)	STRUCTURAL (S)
ELECTRICAL (E)	MECHANICAL (M)

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**DESIGN DISCIPLINE AND ISSUING AUTHORITY (IA)**

DOCUMENTS HAVE BEEN PREPARED AND ISSUED BY EACH ISSUING AUTHORITY AS FOLLOWS:

ARCHITECT (A), PROFESSIONAL ENGINEER – STRUCTURAL (S), PROFESSIONAL ENGINEER – MECHANICAL (M), PROFESSIONAL ENGINEER – ELECTRICAL (E), DATA AND COMMUNICATIONS CONSULTANT (IT), VERTICAL TRANSPORTATION (VT), LANDSCAPE ARCHITECT (L), HARDWARE (H).

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## 1.01 MANDATORY INSTRUCTIONS TO BIDDERS

# Submission Instructions for Suppliers

Please follow these instructions to submit via our Public Portal.

## 1. Prepare your submission materials:

Requested Information

Name	Type
Submission	File Type: Any (.csv, .pdf, .xls, .xlsx, .ppt, .pptx, .bmp, .gif, .jpeg, .jpg, .jpe, .png, .tiff, .tif, .txt, .text, .rtf, .doc, .docx, .dot, .dotx, .word, .dwg, .dwf, .dxf, .mp3, .wav, .avi, .mov, .mp4, .mpeg, .wmv, .zip)

### Requested Documents:

Please note the type and number of files allowed. The maximum upload file size is 100 MB.  
Please do not embed any documents within your uploaded files, as they will not be accessible or evaluated.

## 2. Upload your submission at:

**<https://medbuy.bonfirehub.ca/opportunities/private/fff4cc182a8fa619e44229e4b04b745c>**

Your submission must be uploaded prior to the Closing Time, **December 18, 2025, at 2:00 PM (EST)**. We strongly recommend that you give yourself sufficient time and **at least ONE (1) hour** before Closing Time to begin the uploading process and to finalize your submission.

**To supplement uploaded Bid Security and Agreement to Bond documents uploaded to the Euna Procurement (formerly Bonfire) portal ("Euna") portal, original hard copy documents of the Bid Security and Agreement to bond must be received by the Tendering Call Authority upon request, within 48 hours of the request.**

### Important Notes:

Each item of Requested Information is instantly sealed and will only be visible after the Closing Time.

Uploading large documents may take significant time, depending on the size of the file(s) and your Internet connection speed.

You will receive an email confirmation receipt with a unique confirmation number once you finalize your submission.

Minimum system requirements: Internet Explorer 8/9/10+, Google Chrome, or Mozilla Firefox. Javascript must be enabled.

## **Need Help?**

Sunnybrook Health Sciences Centre uses a Euna portal for accepting and evaluating proposals digitally. Please contact Euna (formerly Bonfire) at [support.bonfire@eunasolutions.com](mailto:support.bonfire@eunasolutions.com) for technical questions related to your submission. You can also visit their help forum at <https://bonfirehub.zendesk.com/hc>

## **1 BIDS**

### **1.1 Intent**

The intent of this Bid call is to solicit and receive a formal Bid for the SHSC C2 Decant (K3E) and GIM Decant (K2E) for Sunnybrook Health Sciences Centre (the "Owner")

Only Prequalified General Contractors may submit bid submissions on this Tender. The Prequalified General Contractors, from Sunnybrook RFSQ No.2733127893 are as follows:

- Maystar General Contractors Inc.
- REA Construction Ltd.
- Dineen Construction Corporation
- BDA Inc.
- Compass Construction Resources Ltd.
- Harbridge & Cross Limited
- Chart Construction Management Inc.
- MJ Dixon Construction Limited
- Elite Construction Management Inc.
- Pomerleau
- Diligent Construction Inc.

Only Prequalified Mechanical Subcontractors from Sunnybrook RFSQ No.2733127893 can be named as subcontractors on this project:

- Black & McDonald Ltd.
- Kelson Mechanical Inc.
- English and Mould Mechanical Systems Ltd.
- Pipe All Plumbing & Heating Limited
- VR Mechanical Services Inc.
- Plan Group Inc.
- Nutemp Mechanical Systems Ltd.
- Canadian Tech Air Systems Inc.

Only Prequalified Electrical Subcontractors from Sunnybrook RFSQ No.2733127893 can be named as subcontractors on this project:

- Black & McDonald Ltd.
- Ontario Electrical Construction Company Limited
- Danik Electrical Construction Company Limited
- Plan Group Inc.
- RPG Electric
- Ainsworth Inc.
- Guild Electric Limited
- Modern Niagara Toronto Inc.

**.1** A mandatory formal briefing meeting and site tour will be held on the date and time and location as stipulated in the Invitation to Bidders. All Prequalified General Contractors, along with Prequalified Electrical/Mechanical Subcontractors wishing to bid, must attend the Mandatory Formal Briefing Meeting and Site Tour. The Formal Briefing and Site Tour is on November 27, 2025, at 10:00 AM (EST) for the General Contractors and on November 27, 2025, at 11:00 AM (EST) for the Electrical/Mechanical Subcontractors. Bidders must RSVP before November 26, 2025, 4:00 PM (EST), stating the name of the attendee (only 1 attendee per contractor) via email to the Bid Administrator G.Soleymani@mohawkmedbuy.ca. Bidders should arrive at least 10 minutes before the meeting time. All Bidders must sign the attendance register prior to commencing the site tour/visit.

**.2 Submission requirements:** Submission must be in accordance with the SHSC C2 Decant (K3E) and GIM Decant (K2E), Drawings and Specifications included with these Submission Documents for:

**Sunnybrook Health Sciences Centre**  
2075 Bayview Avenue, Toronto ON M4N 3M5

And will be received

**Prior to 02:00:00 o'clock p.m local time, on December 18, 2025.**  
Bids will NOT be opened publicly.

**.3 Submission must consist of:**

**.1 Completed Stipulated Price Bid Form**

(a) Note 1:

- Bid Form must be filled out in its entirety; failure to do so may result in disqualification.
- Inconsistencies between dollar amounts in numerical form and in written form may result in disqualification

**.2 Bid Security**

**.3 Agreement to Bond**

**.4 Proposed Construction Schedule**

**.5 Hazmat Acknowledgement Form**

**.6 COVID 19 Acknowledgement Form**

- .4 Submissions must be submitted on the Bid Form provided, filled out and signed by an authorized signing officer from the Bidder's organization and sealed. Bids must be submitted on one copy of the Bid Form provided. **All instructions to Bidders for Bid Submission in this document are Mandatory. Any instructions not followed will result in Bid Disqualification.**
- .5 Bid form must be completed without delineation, alteration or erasures and there is to be no re-capitulation of the work to be done.
- .6 Bids must be for a Stipulated Sum without escalation clauses or other qualifications. Bids will be evaluated on the base bid only. Alternative prices will not be considered in determining the lowest compliant Bidder.
- .7 Prices must exclude: Harmonized Sales Tax where indicated.
- .8 Oral, telephoned, or fax bids, or bids submitted by any other means will not be accepted nor acknowledged. Bids will only be accepted via the MMC Euna Portal (Euna Procurement (formerly Bonfire) portal ("Euna")) described on page 1. Paragraph 1.1.2 states time up to which Bids will be received. This time may be extended by public notice or by written Addendum. Bids not submitted by the submission deadlines stipulated in Paragraph 1.1.2 will be rejected.
- .9 Bidders are reminded that they must base their bids on the manufacturers, installers, materials, equipment and products specified. Bids that are submitted based on alternatives not called for will not be acceptable and will be cause for disqualification.
- .10 Submissions will not be opened until the Owner is in receipt of the submissions.



## 1.2 DESCRIPTION OF WORKS

The project consists of two phases. Phase 1 involves the interior renovation of K Wing East Pod Level 2 (K2E) to facilitate the decanting of GIM. Phase 2 involves the interior renovation of K Wing East Pod Level 3 (K3E) to support the relocation of Oncology patients from C Wing Level 2:

### **K Wing East Pod Level 2 (K2E) - Minor Renovations to facilitate decanting of K3E GIM Patients**

Sunnybrook Health Science (SHSC) intends to relocate its oncology patients to newly renovated spaces on the third floor of Kilgour Wing. It is anticipated that K3E GIM (General Internal Medicine) patients will be decanted into the vacant K2E Inpatient Unit on the floor area below. The second floor of Kilgour Wing East pod (K2E) at the Veterans Centre facility was originally constructed as Inpatient Ward Unit and is currently vacant. Sunnybrook intends to re-occupy these spaces to accommodate the decanting of GIM patients from K3E.

Only minor interior renovations are being considered, including code compliance measures to rectify base building deficiencies, to facilitate relocation of GIM patients from K3E to K2E. The core layout will be updated to meet the program.

There will be a mix of new and existing finishes and fixtures, including Mechanical and Electrical and Structural upgrades as shown on the Contract Documents.

### **K Wing East Pod Level 3 (K3E) - Renovations to support the relocation of Oncology Patients from C Wing Level 2**

Sunnybrook Health Science (SHSC) intends to relocate its oncology patients to newly renovated spaces on the third floor of Kilgour Wing. It is anticipated that K3E GIM (General Internal Medicine) patients will be decanted into the vacant K2E Inpatient Unit on the floor area below. The third floor of Kilgour Wing East & Central pods (K3E/K3C) at the Veterans Centre facility was originally constructed as Inpatient Ward Unit. Sunnybrook intends to retrofit these spaces to accommodate the relocation of Oncology patients and associated clinical program functions from C Wing Level 2.

Although currently the rooms do not meet all OBC and CSA requirements, the hospital intends to carry out minor retrofits and maintain as much of the existing room configurations wherever possible to accommodate clinical Oncology program functions at the proposed location in Kilgour Wing.

K3E renovations will include adjustment to the layout to meet OBC and CSA requirements and/or change of program, selected demolition as well as patching and making good of some exiting millwork and walls that are to remain. Please refer to the Contract Documents for more information, including Mechanical, Electrical and Structural scopes.

## 1.3 CONTRACTORS/ SUB-CONTRACTORS

- .1 Bidders must submit on the Supplementary Bid Form, identified list of sub-contractors and corresponding costs to whom it is proposed to sublet any part of the work.
- .2 Bidder must name only one Subcontractor for each trade Section.
- .3 Should Bidder be awarded the Contract, parties named, including Bidder's own forces must be used to perform the work for which they are named and must not be changed without the Owner's written consent.

- .4 The term "Own Forces", or other such phrase, will not be acceptable where such work will knowingly not be provided by Bidder's own forces. Such flagrant use may be cause for disqualification of bid.
- .5 Immediately after notice of Contract award, the successful Bidder must notify it's named Subcontractors that they have been named.
- .6 The list of sub-contractors set forth must not to be altered or changed except as may be agreed by the Owner and the Engineer prior to the signing of the Contract. Contractor has fully investigated and informed itself as to the qualifications of their named Subcontractors. Contractor fully understands that each named Subcontractor can meet and will provide all of their work as per Bid Documents. Where it is found that a named Subcontractor cannot or will not provide its work as per Bid Documents, the Contractor will be obligated to retain a qualified Subcontractor who will provide the work as per Bid Documents. All costs, including cost differences between Subcontractor's prices, required to change the named Subcontractor to a qualified Subcontractor will be at Contractor's own expense and the Owner will not entertain any requests for any additional monies

## **2 QUESTIONS DURING BIDDING**

### **2.1 Document review**

- .1 Bidders finding discrepancies, ambiguities, or omissions in the Drawings or Specifications are to immediately notify solely the Tender Calling Authority who will issue written instructions to all Bidders in the form of posted written Addenda.

### **2.2 Questions arising during the bidding period must be solely directed to:**

**Biddingo Network Sourcing tool: <https://www.biddingo.com/>**

- .2 Bidders seeking information with regard to the organization of documents and clarification and interpretation of information on drawings or in specification may contact only through Biddingo.
- .3 Questions including questions with regard to quantities, quality, or acceptable manufacturers of materials and equipment or questions with regard to interpretation of the documents will not be discussed or answered by telephone and must be directed to Biddingo. All the questions will be answered by published, posted written Addenda.
- .4 **Questions are due no later than December 4, 2025.**
- .5 Bidders must not contact the Owner, its employees, or its agents, including the Engineering Consultant, except via the Tender Calling Authority in regard to this tender.
- .6 Under no circumstances must the Bidder rely upon any information or instructions from the Owner, its employees, or its agents, including the Consultant, unless the information or instructions are provided in writing by the Tender Calling Authority; and
- .7 The Owner, its employees and/or its agents, including the Consultant, will not be responsible for any information or instructions provided to the Bidder, with the exception of information or instructions provided in writing by the Tender Calling Authority.

## **3 ADDENDA**

- .1 During bidding period Bidders may be advised by Addenda of additions, deletions, or alterations to the Specifications and Drawings. The information contained in the Addenda is to supersede and

amend the Drawings, Specifications and Schedules. These revisions to the work are to be allowed for in the Bid and the Addenda are to become part of the Contract Documents.

- .2 Bidders to state in the space provided on the Bid Form the numbers of the Addenda received and included for in the preparation of the Bid.

## **4 EXAMINATION OF SITE**

### **4.1 MANDATORY FORMAL BRIEFING MEETING AND SITE TOUR**

- .1 A mandatory formal briefing meeting and site tour will be held at date and time and location as stipulated in Invitation to Bidders. **This site tour is a Mandatory Requirement for all Prequalified General Contractors and for Prequalified Mechanical and Electrical Contractors wishing to bid as subcontractors.**

**Date/Time/Location:**

- **November 27, 2025, at 10:00 AM EST for the General Contractors**
  - **November 27, 2025, at 11:00 AM EST for the Electrical/Mechanical Subcontractors**
  - **RSVP to email: [GSoleymani@mohawkmedbuy.ca](mailto:GSoleymani@mohawkmedbuy.ca)**
  - **Location: Sunnybrook Health Sciences Centre, Bayview Campus**
  - **2075 Bayview Avenue, Toronto, ON M3N 3M5**
  - **Meet at: M-Wing Ground Floor Entrance**
- .2 Purpose of meeting is to review full extent of the Project, conduct an inspection of existing premises and to discuss any questions regarding this Project.
  - .3 One representative(s) from each Bidding Contractor must attend. The minutes of this pre-Bid meeting listing attendees may be issued as an Addendum.
  - .4 It is mandatory that General Contractors and Mechanical and Electrical Sub-contractors attend the meeting. All other interested Bidders/sub-trades are also invited to attend. Bids will be accepted only from Bidders (General, Mechanical, Electrical contractors) that attended the mandatory site tour. Bids from Bidders (General, Mechanical, Electrical contractors) who did not participate in the site tour will be disqualified.
  - .5 Bidders must visit and examine the site and the existing building and satisfy themselves as to the conditions of the site, the means of access to same and the nature and quantity of work required.
  - .6 Also ascertain the extent, nature and location of concealed services which may have to be protected, removed or relocated.
  - .7 Information shown on the Drawings is furnished in good faith by the Consultant, but in no way relieve Bidders of the responsibility for ascertaining to their own satisfaction, the nature of conditions at the site. No claims for extra costs for failure to determine any/ all existing conditions will be entertained.
  - .8 Take note of the nature of existing surfaces and include for temporary work necessary to maintain Owner's use of the premises, the roads, and the pathways during the progress of the Contract.
  - .9 In addition to paragraph 4.1, Bidders must visit the Place of the Work as required to become fully conversant with conditions which will be met in performing the Work of the Contract.

.10 Claims for extra payment and extensions to Contract Time will not be considered in respect to conditions which could have been ascertained by an inspection of the Place of the Work prior to close of bids.

## **5 ITEMIZED PRICES**

Yes

## **6 SEPARATE PRICES**

Yes

## **7. ALTERNATE PRICES**

None

## **8. SUBMISSION**

.1 Submission of Bids to constitute proof of the Bidder's inclusion in the proposal for the work to complete the Contract in every respect and provisions for conditions and limitations, particularly with respect to access facilities, working conditions, existing conditions, storage space, codes, laws, ordinances, and regulations, whether mentioned in the Bid Documents or not.

.2 Arrangements have been provided for the Bidder to obtain clarification with regard to discrepancies, ambiguities, or omissions in the Bid Documents and to visit and review the conditions at the site and therefore the submission of a Bid will be construed as a waiver of any claims for extra compensation on account of un-anticipated work caused by existing conditions or un-expected interpretation of the Bid Documents.

.3 The Bidder acknowledges and agrees that nothing contained herein, no act done or expense incurred in the preparation of the Bid, no trade or industry custom or practice and no representation or assurance that may have been given to the Bidder by the Owner or Consultant, must in any manner legally bind the Owner to accept this Bid, the lowest Tender or any Tender submitted. The Bidder acknowledges and agrees that the Owner must have complete and unrestricted liberty in this regard and may reject or accept any Bid in whatever manner, at whatever Bid Price and on whatever terms and for whatever reason as the Owner, in their sole discretion, considers to be in their best interest, all without liability or obligation of any kind to any Bidder.

.4 The Owner must not be held responsible for any liability, cost, expense loss of damage incurred, sustained or suffered by any Bidder prior to, subsequent to, or by any reason of delay in the acceptance or non-acceptance of this Bid save as provided in the Contract. Bids are subject to a formal Contract being prepared and executed.

.5 No Bid must be submitted or accepted from any persons or corporations which has any claim or legal proceeding against the Owner with respect to any previous Contract. No Subcontractor that has any claim or legal proceeding against the Owner must be named as a Subcontractor of the Bidder.

- .6 In the event that two or more Bidders submit compliant Bids that contain identical Bid pricing, each bidder will be notified of the tie and will have the opportunity to submit a new bid in the proper form within twenty-four hours of being notified

## **9. RESERVED RIGHTS OF THE OWNER**

- .1 Bids not received as per the Submission Instructions will be disqualified and will not be accepted by the Owner.
- .2 In addition to disqualification in the event of non-compliance with any of the Mandatory Requirements, the Owner reserves the right, in the Owner's sole discretion, to reject or disqualify any bid that does not, in Owner's reasonable discretion, comply with any other instruction, requirement, term or condition set out herein; or otherwise any non-responsive, and conditional Bids or Bids that are improperly prepared, that are unsigned, improperly signed or sealed, conditional, illegible, obscure, contain arithmetical errors, erasures, alterations, or irregularities of any kind.
- .3 The Owner reserves the right to disqualify the Bid of any Bidder who experiences a material change in circumstances after submission of its Bid, including where the Bidder's staffing is materially different from that specified in its pre-qualification documentation.
- .4 Bids received from any other Bidder that has any claim, legal proceeding, or other Construction Project issues, with the Owner or that names a Subcontractor that has any claim, legal proceeding or other Project issues with the Owner, with respect to any previous contract or tender may be rejected at the sole discretion of the Owner.
- .5 Presentation of evidence of collusion, intent to defraud, or illegal practices on the part of a Bidder, will cause its bid to be declared non-compliant and disqualified whether opened or not.
- .6 The Owner reserves the right, in Owner's sole discretion, to cancel this tender at any time without awarding a Contract to any Bidder.
- .7 The owner reserves the right to disregard all non-confirming, non-responsive and conditional bids.
- .8 The Owner reserves the right to negotiate Contract terms with the lowest compliant Bidder or Bidders, or should the Owner not receives any satisfactory or compliant bids, to negotiate a Contract in accordance with paragraph 12.4 (below).
- .9 Discrepancies between words and figures will be resolved in favour of words. Discrepancies between the indicated sum of any column of figures and correct sum thereof will be resolved in favour of the correct sum.
- .10 The Owner reserves the right to request a Bidder to provide clarification regarding any aspect of its Bid, and/or to submit supplementary written information in relation to such request; and to incorporate a Bidder's response to any such request for clarification into the Bidder's Bid, provided that any such clarification must only permit the provision of additional detail but may not contradict or amend a material term of the Bid. The Submission of a Bid does not obligate the Owner to accept any Bid or to proceed further with the Project. The Owner may, in its sole discretion, elect not to proceed with the Project, in whole or in part, and the Owner may elect not to accept any bid that, in Owner's reasonable discretion, does not comply with any instruction, requirement, term or condition herein; and Owner reserves the right, in Owner's sole discretion, to cancel this Bid at any time without awarding a Contract to any Bidder.
- .11 Alternatively, should the Owner not receive any satisfactory Bids, it may, in its sole and absolute

discretion, revise the Instructions to Bidders, issue Post-Bid Addenda for re-pricing, or negotiate a Contract for the whole or any part of the Project with any of the Bidders.

- .12 A Bidder's Bid shall be null and void and disqualified
  - .1 Upon the institution by or against the Bidder of insolvency, receivership or bankruptcy proceedings or any other such proceedings;
  - .2 Upon the Bidder making an assignment for the benefit of creditors; or
  - .3 Upon the Bidder's dissolution or ceasing to do business
- .13 The Owner reserves the right not to accept the Bidder's proposed Schedule and reserves the right to clarify or negotiate the Schedule with the successful Bidder.

## **10 WITHDRAWAL AND ACCEPTANCE OF BIDS**

- .1 A bid may be withdrawn at any time prior to the time and date fixed for receiving bids, but only on a request in writing, signed by the Bidder or his agent-in-fact.
- .2 Withdrawn bids may be resubmitted provided the resubmitted bid is received at the office previously indicated prior to the time and date fixed for receiving bids.

A bid may not be withdrawn at or after the time and date fixed for receiving bids and must be irrevocable and remain open to acceptance by the Owner:

- (1) until some other party has entered into a Contract with the Owner for performance of the Work, or
- (2) until 120 days after the time and date fixed for delivering bids, whichever occurs first (the "Bid Acceptance Period").
- .3 The 120 day period referred to above must commence at 12:00:00 a.m. of the day fixed for receiving bids and must terminate at 12:00:00 a.m. of the 120th day thereafter. If the 120th day falls on a Saturday, Sunday or statutory holiday, such day or days must be omitted from the computation.
- .4 The lowest or any bid will not necessarily be accepted and the Owner reserves the right to reject any and all bids, including without limitation, the lowest priced bid, and to award the Contract who whomever the Owner, in its sole and absolute discretion, deems appropriate, notwithstanding any custom, usage or agreement in the industry or trade, or any other policy or practice to the contrary. The Owner further reserves the right, in its sole and absolute discretion, to accept or reject any bid which is incomplete, obscure, or irregular, which has erasures or corrections in the documents, which omits one or more the prices, fees, or costs required to be stipulated in the bidding forms, which contains prices that the Owner considers unbalanced, or which is not accompanied by the proper bid security.
- .5 Without limiting the generality of the rights prescribed in the preceding paragraph above, the Owner may, in its sole discretion, elect not to proceed with the project and elect not to accept any and all bids for any reason including, but not limited to, bids not being within the Owner's budget. Alternatively, should the Owner not receive any satisfactory bid including, but not limited to receipt of no compliant bids, it may, in its sole and absolute discretion, revise the Instructions to Bidders, or negotiate a contract for the whole or any part of the project with any one or more of the Bidders, or firms not previously pre-qualified. Under no circumstances, must the Owner be responsible for any costs incurred by the Bidders in the preparation of their bid.
- .6 The criteria used and applied by the Owner in evaluating the bids and awarding the contract are within the Owner's sole and absolute discretion. Without limiting the generality of the foregoing,

additional criteria to be considered by the Owner in evaluating the bids may also include one or more the following: total costs to the Owner, completion times in the bid, any changes to pre-qualification information, ability to ensure continuous availability of qualified and experienced personnel, proposed Construction Schedule, price compliance of bids, and any other factor that the Owner, in its sole discretion, deems relevant.

- .7 Award of Contract will be by written notification to the successful Bidder
- .8 Delivery by registered mail or common carrier, to the address given by the Bidder in its Bid form, of notification of award of the Contract to the Bidder by the Owner must constitute acceptance of said bid.
- .9 If bidder has not been so notified within the Bid Acceptance Period, the bidder may, unless bidder has otherwise agreed or offered and except as otherwise provided herein, withdraw its bid without penalty, forfeit, or obligation to the Owner of any kind.

## 11 ERRORS IN BIDS

- 1 Owner will not entertain requests for gratuitous payments arising from any errors alleged to have been made in the Bid that the Owner has accepted with the procedures described in the Bid Documents.

## 12 CONTRACT (MANDATORY REQUIREMENTS)

- .1 The successful Bidder must be required to sign, , Canadian Standard Construction Document CCDC 2-2020 for Stipulated Price Contract, as amended by Section 00 73 00, as bound herein, and return the executed Contract to the Owner within seven (7) days after award of Contract by Owner.
- 2. The Bidder accepts and agrees that, after delivery to the Owner of the executed Contract and required Bonds and Certificates of Insurance, the Owner will provide written authorization to the Bidder to commence the Work and that, upon receipt of such authorization, the Bidder will commence the Work actively at the Place of the Work within 10 Working Days.
- .3 The successful Bidder must provide List of Subcontractors and Cost Breakdown, **Contractor HAZMAT Acknowledgement Form** and **Construction Delays due to the COVID 19 Acknowledgement Form**.

## 13 BONDS AND INSURANCE

### 13.1 Agreement to Bond

Each Bidder must submit with its bid an Agreement to Bond issued by a duly incorporated surety company authorized and licensed to issue such instruments and Bonds in the Province of Ontario obliging the surety company to issue a Performance Bond and a Labour and Material Payment Bond, each in the amount of for 50% of the Total Amount Payable (after HST) , and in the forms as follows:

- .1 Performance Bond: Form 32, Under Section 85.1 of the Construction Act
- .2 Labour and Material Payment Bond: Form 31, under section 85.1 of the Construction Act.
- .3 The Agreement to Bond must be valid for the Bid Acceptance Period.
- .4 Cost for all bonds is included in the bid price.

- .5 Performance Bond and Labour and Material Payment Bond (collectively the "Bonds") must be issued by a duly incorporated surety company authorized to issue such instruments in the Province of Ontario.

### **13.2 Bid Security**

- .1 Bidders must attach to their Bid a Bid Bond made payable to Sunnybrook Health Sciences Centre for the amount of **10% of the Bid Value** as evidence of good faith that, if awarded the Contract, the Bidder will execute and enter into a formal agreement within the time required and will furnish the security required to secure the performance of the terms and conditions of the Contract.
- .2 Bidders must attach and submit bid security together with Bid Form.
- .3 The Bid Bond must be in force for a period of 120 days from day fixed for receiving bids.
- .4 Bid Bonds must be in accordance with the Construction Act.
- .5 Bid Bonds must be issued by a duly incorporated surety company authorized to transact business in the Province of Ontario.
- .6 Bid bonds must be properly executed by both Bidder and Surety.
- .7 If a Bidder whose bid is accepted by the Owner, within the specified 120 day acceptance period, refuses or fails, within 15 days after a Contract is offered to him for acceptance, (1) to enter into a Contract with the Owner for the performance of the Work or (2) to provide contract performance security, or security for payment of claims, or both, if and as required by the Bid Documents, the Bidder must be liable to the Owner for the difference in money between the amount of his bid and the greater amount for which a Contract for the Work is entered into with some other party, up to the maximum amount of the bid security provided.
- .8 Bid security will be returned to all Bidders after an agreement has been signed by both the Owner and the successful Bidder and the Bonds and Certificate of Insurance have been delivered to the Owner
- .9 Bids submitted without Bid Security will be disqualified.

### **13.3 Labour and Materials Payment Bond (Mandatory Requirements)**

- .1 Bidders must include with their Bid agreements to Bond for 50% labour and materials payment.
- .2 Agreement to bond must be valid for the bid acceptance period.
- .3 Bidders must submit security to Owner within 7 days of date of receiving notification that Bidder has been awarded Contract but before signing Contract.
- .4 Labour and Material Payment Bond must be in accordance with the Form 31 of Section 85.1 of the Construction Act,
- .5 Labour and Material Payment Bond must be issued by a duly surety company authorized to transact business in the Province of Ontario.



- .6 Labour and Material Payment Bond must be issued by Surety Company acceptable to the Owner.
- .7 Labour and Material Payment Bond must be properly executed by both the Bidder and Surety Company.
- .8 Submission of the Labour and Material Payment Bond must be a pre-condition to commencement of the Work.

#### **13.4 Performance Bond (Mandatory Requirements)**

- .1 Bidders must include with their Bid agreements to Bond for 50% performance.
- .2 Performance Bond must be in accordance with Form 32 of Section 85.1 of the Construction Act.
- .3 Agreement to bond must be valid for the bid acceptance period.
- .4 Security in the form of a bank letter of credit is not acceptable.
- .5 Bidders must submit security to the Owner within 7 days of the date of receiving notification that the Bidder has been awarded Contract but before signing Contract.
- .6 Bidder must submit with his Bid the Sunnybrook Hospital's standard form of Agreement to Bond stating that Surety Company is prepared to provide the required Performance Bond.
- .7 Performance Bond must be issued by a duly incorporated surety company authorized to transact business in the Province of Ontario.
- .8 Performance Bond must be issued by Surety Company acceptable to the Owner.
- .9 Performance Bond must be properly executed by both the Contractor and Surety Company.
- .10 Submission of the Performance Bond must be a pre-condition to commencement of the Work.

#### **14. NOTE: Submission of Documents**

**To supplement uploaded Bid Security and Agreement to Bond documents uploaded to the Euna portal, original hard copy documents of the Bid Security and Agreement to bond must be received upon request within 48 hours of the request.**

#### **15 INSURANCE (MANDATORY REQUIREMENTS)**

- 1. Bidders must submit certificate of insurance confirming a general liability insurance of \$5 million to the Owner within 7 days of the date of receiving notification that Bidder has been awarded Contract but before signing Contract.

2. Certificates of insurance must be issued by a duly incorporated insurance company authorized to transact business in the Province of Ontario.
3. Bidders must submit Builder's Risk Insurance to the Owner within 7 days of the date of receiving notification that Bidder has been awarded Contract but before signing the Contract.
4. Insurance documents shall meet the requirements of CCDC 2 – 2020, as amended by 00 73 13 – Supplementary General Conditions.

## **16 BID DOCUMENTS**

1. Bidder is responsible for checking the Drawings and Specifications received to ensure that the documents are complete in accordance with the List of Bid Documents.
2. After the Contract is signed the successful Bidder will be given a complete sets of Specifications and Drawings in addition to the signed and sealed Contract Document set.

## **17 MATERIALS AND EQUIPMENT**

1. Bids must be based upon materials and equipment of manufacture, type and design specified.
2. Bid Price must be based on using materials or equipment of the manufacturer named in the Specification. If more than one manufacturer's name is listed in Specification for a specific item, the Bidder may choose the manufacturer, whose price is used in preparing Bid.
3. Material and equipment, considered equal to that specified, may be proposed at time of Bidding. When requested, submit specifications, information and details of proposals to Consultant.

## **18 INTERPRETATIONS AND MODIFICATIONS OF BID DOCUMENTS**

1. Submit questions about the meaning and intent of the Bid Documents to the Bid Administrator
2. Bidders must promptly notify the Bid Administrator of any ambiguity, inconsistency or error, which they may discover upon examination of the Bid Documents or of the site, existing premises and local conditions.
3. Replies to questions and modification of the Bid Documents will be issued in writing by Addenda. Replies to questions and modifications made in any other manner will not be binding and must be considered without legal effect.
4. The Owner and Consultant will not recognize nor participate in any electronic project management program.

## **19 CUTTING AND REMEDIAL WORK**

1. Refer to General Conditions regarding cutting and remedial work.
2. Bidders must include costs for cutting and remedial work in their bid price.
3. Bidders must obtain required information from their various Subcontractors requiring such cutting and remedial work prior to submission of bid.

## **20 REVIEW OF BID DOCUMENTS**

1. No parts of the Bid Documents must be issued by Contractors to any Subcontractors or material or equipment Supplier, for bidding purposes without Section 00 73 00 and Division 1, General Requirements, being attached thereto.
2. Contractors will be responsible for reviewing the Bid Documents, and ensuring their Subcontractors, Product and materials Suppliers review the Bid Documents, prior to submitting a bid to ensure they have an overall understanding of the entire Project's scope of work. Mechanical and electrical Subcontractors are specifically instructed to review non-mechanical and non-electrical parts of the Bid Documents for additional information and details related to their trades.
3. The Contractor's attention is drawn to the intricacy of working in the existing building or reworking existing building components to accommodate new construction. This involves removals, cutting, restoration, and protection of existing work or conditions during the duration of the Contract.
4. While every effort has been made to show or note the extent of the work in the Contract Documents, the Contractor by submitting its bid acknowledges the complexities involved in a Project of this size and type.
5. It is therefore imperative that Contractor evaluates the Contract Documents and visits the Place of the Work and conducts a survey of existing conditions upon which new work will be dependent. The Owner on account of the Contractor's failure to comply with the foregoing will entertain change in either Contract Time or Contract Price.
6. Well in advance of commencement of the Work; notify Consultant and Owner in writing of any part of the Work that is to be started within existing building. At no time interfere with operation of any department without written approval of Owner. It is essential for existing building to remain functional at all times. Contractor must, when required on occasion, expedite work outside of Contractor's normal working hours. Owner will cooperate to keep such overtime hours to a minimum.

## **21 OVERTIME COSTS**

- .1 Bids have been requested only from Pre-Qualified Contractors. Overtime costs may be required to perform the Work without adversely affecting the normal operation of the Owner and to maintain the Project schedule as specified.
- .2 Any overtime costs, including extended and/or double shift and weekend work hours, necessary to complete the Work or any part thereof within the Contract Time must to be included in the bid price.
- .3 Bidders are hereby advised that time is of the essence and the Project schedule cannot be extended except as provided for in the Contract Documents.

## **22 INFECTION CONTROL DURING CONSTRUCTION**

- .1 The successful Bidder will be required to provide infection control during the Work in accordance with relevant Spec Section

- .2 Sunnybrook's Infection Prevention Control Services (IPCS) will investigate and advise on the risks of organisms that exist in the Place of Work. In addition to the requirements in the Contract Documents, the Contractor will take all reasonable steps to eliminate any infectious risks where possible and minimize those risks that cannot be eliminated.

## **23 STAFF**

- .1 All Contractors and Subcontractors will be expected to maintain the staff team from start to finish. Any modifications to the team composition from those involved must be approved in writing by the Owner prior to implementation. 2 weeks notice is required prior to any proposed change for Owner review prior to the start of the Work. 4 weeks notice is required prior to any proposed change for Owner review during the Work.

## **24 COLD WEATHER WORKING**

- .1 Particular attention is drawn to the requirement that the Bidder must commence work immediately after the Contract is executed and the Certificates of Insurance is delivered to the Owner and must continue full scale operations through winter months until the work described is complete.
- .2 The Bid Price must include the costs for temporary heating, temporary shelters and all other necessary cold weather measures to enable the work to proceed without delay regardless of adverse weather conditions.

## **25 CASH ALLOWANCES**

- .1 Include in bid price cash allowances specified in Section 01 00 00. Cash allowances are to be carried administered by Division 1 (and not by other Divisions), including Mechanical and Electrical allowances.
- .2 Contractors shall make provision in their schedule for incorporation in the work of products/materials and labour covered under cash allowances.
- .3 Cash allowances must be utilized only for the purpose of which the cash allowance was intended.
- .4 Cash allowances may be transferred from one category to another at the discretion of the Consultant and/or Owner. All cash allowances are to be administered through issuance of a change order which identifies the cash allowance item.

## **26 SCHEDULING OF WORK (MANDATORY REQUIREMENTS)**

- .1 Time is the essence of this Contract. The Bidder must indicate in the space provided on the Bid Form all scheduling information requested. Bids submitted without this information will be deemed Disqualified.
- .2 Prior to award of the Contract, Sunnybrook will request that the Bidder supply a final updated Construction Schedule which would include the updated project start date and any other changes to the Construction Schedule from the schedule provided with the Bid

Submission. The revised Construction Schedule must be approved by Sunnybrook and Consultant prior to Contract Award.

- .3 In recognition that the COVID-19 pandemic is affecting current construction in Ontario and globally, Sunnybrook is requesting that the Bidder highlight any anticipated scheduling buffering or anticipated delays to the start date as well as any other changes to the Construction Schedule resulting from COVID 19 or otherwise.

## **27 DEBRIEFING**

Unsuccessful Bidders may request a debriefing after receipt of a notification of award. All requests must be in writing sent to same location as described in section 3.02 and must be made within sixty (60) days of notification of award. The intent of the debriefing information session is to aid the unsuccessful Bidder in presenting a better bid in subsequent bidding opportunities. Any debriefing provided is not for the purpose of providing an opportunity to challenge the procurement process.

## **28 BID PROCESS PROTEST**

A Bidder who wishes to protest the process utilized in this Bid Call must deliver written notice of the protest to the Owner. Sunnybrook shall acknowledge receipt of the protest in writing within five (5) working days; and deliver a response to the Bidder in writing within twenty (20) working days. Sunnybrook's Bid Protest Process is subject to the relevant Bid Protest terms as set out in the AIT and Ontario-Quebec Procurement Agreement.

## **29 CONFLICT OF INTEREST**

Bidders must disclose any actual or possible conflict of interest that may arise from its submission of a Bid, or execution of a Contract for the provisioning of Work as a result of this bid process. Please declare such information in writing to the Owner, prior to submission of Bid.

If, at the sole and absolute discretion of Owner, it is discovered that a Bidder fails to disclose all actual or potential Conflicts of Interest, Owner may disqualify the Bidder or terminate any Contract awarded to that Bidder pursuant to this bid process.

If there is no declaration, the Bidder will be deemed to declare that: (1) there was no Conflict of Interest in preparing its bid; and (2) there is no foreseeable Conflict of Interest in performing the contractual obligations.

## **30 FREEDOM OF INFORMATION AND PROTECTION OF PRIVACY ACT**

The Freedom of Information and Protection of Privacy Act (Ontario), applies to records in the custody or control of Ontario hospitals, and includes any information provided by Bidders in connection with this RFQ. Such information may be subject to requests for access under that Act, and can only be withheld from disclosure in specific circumstances.

## **31 COMPETITION ACT**

Under Canadian law, a Bidder's submission must be prepared without conspiracy, collusion, or fraud.

For more information on this topic, visit the Competition Bureau website at <http://www.cb.gc.ca/eic/site/cb-bc.nsf/eng/01240.html>, and in particular, part VI of the *Competition Act*, R.S.C. 1985, c. C-34.

## **32 AGREEMENT ON INTERNAL TRADE**

This bid call is subject to Annex 502.4 ("Procurement – Provisions for Municipalities, Municipal Organizations, School Boards and Publicly Funded Academic, Health and Social Services entities") of the Agreement on Internal Trade.

**END OF SECTION**

**COVID 19 ACKNOWLEDGEMENT FORM**

**Bidder acknowledges that the ongoing COVID 19 Pandemic may cause the Hospital to require to shut down the unit in the event of an outbreak. The Bidder agrees to indemnify the Hospital from any claim delays or extra charges of any kind related to scheduling requirements needed due to Covid 19.**

\_\_\_\_\_  
**Name**

\_\_\_\_\_  
**Date**

\_\_\_\_\_  
**Signature**

SUNNYBROOK HEALTH SCIENCES CENTRE

**CONTRACTOR'S ACKNOWLEDGEMENT  
(HAZMAT ACKNOWLEDGEMENT FORM)**

Sunnybrook Health Sciences Centre ("Sunnybrook") has included in the Tendering information for this contract a copy of the list of any designated substances present at the Project or Work site. The Notice of Designated Substances included in the Tendering Information is attached to this Acknowledgement.

If awarded this Contract, the Contractor, as *Contractor* within the meaning of the *OHSA*, undertakes:

to inform other contractors and all subcontractors retained to perform services on the Project or the Work of the existence of the designated substances, if any, which are present at the Project, and to provide to other contractors and all subcontractors a copy of the list of designated substances which is attached to this Acknowledgement, prior to entering into any contracts with those other contractors or subcontractors for the supply of services;

to notify Sunnybrook of the presence of any potentially hazardous materials or toxic substances which will be brought to the Project or the Work by the Contractor, or Contractor's employees and to provide all applicable MSDS sheets, if any, to Sunnybrook;

to ensure that other contractors and all subcontractors retained to supply services for the Project or the work notify Sunnybrook of the presence of any potentially hazardous materials or toxic substances they bring to the Project or the Work and ensure that they provide all applicable MSDS sheets, if any, to the Contractor, other contractors and all subcontractors to so comply.

Contractor:

Contract to be performed:

*The Contractor acknowledges that he has received the List of Designated Substances attached to the Tendering Information, and agrees to be bound by the undertakings set out above.*

\_\_\_\_\_  
Date

\_\_\_\_\_  
Contractor's Signature

**Note:** This Acknowledgement is an integral element of the Tender Documents.

This Acknowledgement must be signed and returned with the Tender Bid documents.



TO: Sunnybrook Health Sciences Centre

FROM: \_\_\_\_\_

1 **BID/OFFER**

1.1 I/We declare that I/we have carefully examined the bidding documents including Addenda No. \_\_\_\_\_ to No. \_\_\_\_\_, prepared by NORR Architects and Engineers Limited, and visited and investigated the site, and examined all conditions affecting the Work for

**Sunnybrook Health Sciences Centre  
SHSC C2 Decant (K3E) and GIM  
Decant (K2E)**

and if notified in writing of the acceptance of this Bid within 120 days from the date of bid closing, I/we agree to provide all materials and labour for the proper completion of the Work for the Stipulated Price of:

\_\_\_\_\_ and \_\_\_\_/100 Dollars

(\$\_\_\_\_\_) in lawful money of Canada; included in which are labour, materials, products, equipment, allowances, services and respective overhead, profit, duties, taxes (except the Harmonized Sales Tax), disbursements and all other charges.

1.2 I/We have identified that the Harmonized Sales Tax, in the amount of \_\_\_\_\_ and \_\_\_\_/100 Dollars (\$\_\_\_\_\_) in lawful money of Canada, is applicable to the Work, but is excluded from my/our Bid Price

2 **ITEMIZED PRICES**

2.1 The following Itemized Prices are included in my/our Bid Price.

2.2 Itemized prices include labour, materials, products, equipment, services, overhead, profit, duties and taxes (excluding the Harmonized Sales Tax), disbursements, and all other charges. If these itemized prices are accepted, the following sums shall be deducted from my/our Bid Price:

1. Itemized Price No.1:

Isolation Room AHU (K3E), Telemetry.

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- 2.3 I/We agree, Itemized Prices are valid and subject to acceptance by the Owner for a period of 120 days from date of Bid receipt. If accepted after 120 days from Bid receipt, Itemized Price values provided shall be used as an estimate in determining the deduction..

### 3 SEPARATE PRICES

- 3.1 I/We the undersigned offer the Separate Prices described below.

- 3.2 I/We agree that:

- .1 All prices submitted take into consideration and allow for changes and adjustments in other work as may be necessary to provide a finished and functional result, unless specifically indicated otherwise.

- .2 The Separate Prices are amounts stipulated by bidders for solicited options which are be stated as additions, deductions or no change to the Bid Price. Without limiting its rights under the Instructions to Bidders, the Owner reserves the right to accept or reject any of the Separate Prices. Acceptance of Separate Prices is subject to the earlier acceptance of the bid. Prices listed hereunder do not include the Harmonized Sales Tax (HST) but include all other eligible taxes. These amounts shall be irrevocable for the 120 days (bid irrevocability period) provided in the Instructions to Bidders.

#### 3.3 Separate Price No.1:

- .1 **Base Bid Description:** All Work associated with Sunnybrook Health Sciences Centre (SHSC) Decant (K3E) and GIM Decant (K2E) as described in the Bid Documents.
- .2 **Separate Price Description:** Work associated with Sunnybrook Health Sciences Centre (SHSC) GIM Decant (K2E) only.
- .3 Decrease in the Schedule (Weeks): \_\_\_\_\_
- .4 Deduct from Base Bid Price: \$ \_\_\_\_\_
-

**3.4 Separate Price No.2:**

.1 **Base Bid Description:** All Work associated with Sunnybrook Health Sciences Centre (SHSC) Decant (K3E) and GIM Decant (K2E) as described in the Bid Documents.

.2 **Separate Price Description:** Work associated with Sunnybrook Health Sciences Centre (SHSC) Decant (K3E) only.

.3 Decrease in the Schedule (Weeks): \_\_\_\_\_

.4 Deduct from Base Bid Price: \$ \_\_\_\_\_

**4 CASH ALLOWANCES**

4.1 I/We have included in my/our Stipulated Price all Cash Allowances identified in Section 01 21 00, Allowances.

**5 COMPLETION DATE**

5.1 I/We agree, if notified of award of a Contract, to immediately commence Work actively and will attain the following completion dates:

.1 Substantial Performance of the Work within \_\_\_\_\_, weeks after receiving notice of Contract Award.

.2 Total Completion Date of the Work within \_\_\_\_\_, weeks after receiving notice of Contract Award.

**6 BONDS AND INSURANCE**

6.1 Attached herewith is a Bid Bond issued by a Surety Company licensed to conduct surety in Province of Ontario, made payable to the Owner in the amount of ten percent (10%) of the Bid Price and carrying a 120 day time limit from the time set for receipt of Bids, which may be used in part or in whole, at the discretion of the Owner, in the event we fail to enter into a Contract for the Work when notified.

6.2 Attached herewith is an Agreement to Bond from a Surety Company licensed to conduct surety in Province of Ontario, stating that they agree to provide a Performance Bond for 50% of the Total Amount Payable and a Labour and Material Payment Bond for 50% of the Total Amount Payable.

6.3 I/We agree to comply with the requirements of document CCDC2-2020, as amended, with respect to Bonds and Insurance.

**7 PROJECT MANAGEMENT**

7.1 I/We agree to assign \_\_\_\_\_(name) as the Project Manager and they will assign \_\_\_\_\_(name) as their full-time site superintendent for duration of the Contract.

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8 **LIST OF SUBCONTRACTORS**

8.1 I/We propose to use for the above named Project the Subcontractors named herein, and have included the respective costs associated with the below named Subcontractors in our bid price.

8.2 I/We submit that, in proposing the following Subcontractors, I/we have consulted each and has ascertained to my/our complete satisfaction that those named are fully acquainted with the extent and nature of the work involved and of the proposed construction schedule, and that they will execute the work to conform to the requirements of the Contract Documents.

Division /Section of Work	Subcontractor's Company Name	Price (\$)
<b>ABATEMENT</b>		
<b>STRUCTURAL</b>		
<b>MECHANICAL</b>		
<b>ELECTRICAL</b>		

8.3 I/We agree to assign \_\_\_\_\_(name) as the Abatement Subcontractor, for the price of \$ \_\_\_\_\_, and they will assign \_\_\_\_\_(name) as their full-time abatement site superintendent for duration of the Contract.

8.4 I/We agree to assign \_\_\_\_\_(name) as the Structural Subcontractor, for the price of \$ \_\_\_\_\_, and they will assign \_\_\_\_\_(name) as their full-time structural site superintendent for duration of the Contract.

8.5 I/We agree to assign \_\_\_\_\_(name) as the Mechanical Subcontractor, for the price of \$ \_\_\_\_\_, and they will assign \_\_\_\_\_(name) as their full-time mechanical site superintendent for duration of the Contract.

8.6 I/We agree to assign \_\_\_\_\_(name) as the Electrical Subcontractor, for the price of \$ \_\_\_\_\_, and they will assign \_\_\_\_\_(name) as their full-time electrical site superintendent for duration of the Contract.

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9 BID IN FORCE

- 9.1 I/We agree that this Bid is valid and subject to acceptance by the Owner for a period of 120 days from date of Bid receipt, and that if notified of award of the Contract I/we will:
- .1 execute a Contract with the Owner on the specified Form of Agreement.
  - .2 furnish to the Owner, at time of contract signing, copies of insurance policies as required by the Conditions of the Contract.
  - .3 furnish to the Owner, at time of contract signing, a Performance Bond and a Labour and Material Payment Bond, issued by a Surety acceptable to the Owner, each in the amount of 50% of the Total Amount Payable (after HST).
  - .4 furnish to the Owner evidence that all Worker's Compensation dues, in accordance with the laws of the Province of Ontario, have been paid.
  - .5 undertake to schedule and organize the progress of the Work so that priorities for completion of various areas will be maintained, as indicated by the Construction Schedule.

Name of Company: \_\_\_\_\_

Address of Company: \_\_\_\_\_

\_\_\_\_\_

Signature(s) of Authorized Representative(s)

\_\_\_\_\_

Name(s) and Title(s) of Authorized Representatives (Please print or type)

Signature of Witness

\_\_\_\_\_

Name(s) and Title(s) of Witness (Please print or type)

Dated at \_\_\_\_\_ this \_\_\_\_\_ day of \_\_\_\_\_ 20

H.S.T. Registration Number \_\_\_\_\_

SEAL

Bids by Limited companies shall be submitted under corporate seal.

Bids by individuals or partnerships shall be witnessed.

END OF BID FORM

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End of Section

**ISSUED DATE:** 2025-11-20  
**ISSUED FOR:** TENDER

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**1.1 FORM OF CONTRACT**

- 1.1.1 The form of Contract, including the Agreement, Definitions, and General Conditions is CCDC 2 – 2020, Stipulated Price Contract, subject to the modifications specified in Section 00 73 00 – Supplementary Conditions.

**1.2 CONTRACT COPYRIGHT AND AVAILABILITY**

- 1.2.1 The CCDC form of Contract is a copyrighted document published by the Canadian Construction Documents Committee. It is incorporated into these Bid Documents by reference. It is available for purchase from any CCDC document outlet. Refer to [ccdc.org](https://www.ccdc.org).

**END OF DOCUMENT**

**1.1 INTENT**

- 1.1.1 Sunnybrook Health Science Centre's Supplementary Conditions for the Stipulated Price Contract – CCDC 2-2020 are attached hereto.
- 1.1.2 These Supplementary Conditions amend the General Conditions of CCDC 2-2020 as indicated. Provisions not amended remain in full force and effect.

END OF SECTION



## GENERAL REFERENCE

The Standard Construction Document, CCDC 2 2020, Stipulated Price Contract, consisting of the Agreement between *Owner* and *Contractor*, Definitions and the General Conditions of the Stipulated Price Contract, and these Supplementary Conditions, are part of the *Contract Documents*.

The following Supplementary Conditions shall be read in conjunction with the Canadian Standard Construction Document, CCDC 2 2020.

Section and paragraph references below are to the corresponding sections and paragraphs of the Agreement between *Owner* and *Contractor*, Definitions and General Conditions of the Stipulated Price Contract all forming part of Standard Construction Document, CCDC 2 2020, Stipulated Price Contract. The Stipulated Price Contract, CCDC 2 2020, is amended as follows:

- **GENERAL**

- These Supplementary Conditions and Amendments shall modify, delete and/or add to the Agreement between *Owner* and *Contractor*, Definitions and General Conditions of the Stipulated Price Contract CCDC 22020.
- Where any article, paragraph or subparagraph in the Agreement, Definitions or General Conditions is supplemented by one of the following, the provisions of such article, paragraph or subparagraph shall remain in effect and the supplemental provisions shall be considered as added thereto.
- Where any article, paragraph or subparagraph in the Agreement, Definitions or General Conditions is amended, deleted, voided, or superseded by any of the following, the provisions of such article, paragraph or subparagraph not so amended, voided, deleted or superseded, shall remain in effect, and the numbering of the deleted item will be retained, unused.

- **AGREEMENT BETWEEN OWNER AND CONTRACTOR**

- ARTICLE A1 THE WORK

- Delete paragraph 1.3 and inserting new paragraph 1.3 to read as follows:

“1.3 commence the *Work* by the \_\_\_\_\_ day of \_\_\_\_\_ in the year \_\_\_\_\_ and, subject to adjustment in the *Contract Time* as provided for in the *Contract Documents* attain *Ready-for-Takeover*, by the *Scheduled Ready-to-Takeover Date*; and attain the *Total Completion of the Work* by the *Scheduled Total Completion Date*.”

- ARTICLE A5 PAYMENT

- Amend paragraph 5.2.1(1) by deleting “for the first 60 days”.
- Delete paragraph 5.2.1(2) and substitute the following: “Intentionally deleted”.

- ARTICLE A8 SUCCESSION

- Amend paragraph 8.1 by in line 4, inserting “permitted” before “assigns”.

- ARTICLE A9 TIME OF THE ESSENCE

- Add new Article A9 as follows:

- “9.1 *Contractor* acknowledges and agrees that one of the reasons *Contractor* was selected for the *Work* is *Contractor’s* representation and warranty that it will attain *Ready-for-Takeover* and the *Total Completion of the Work* by the dates set out in Article A1, paragraph 1.3. *Contractor* acknowledges and agrees that it has been advised by *Owner* that it is critical to *Owner* that *Ready-for-Takeover* be achieved by the prescribed dates and that time is of the essence of this *Contract*.
- 9.2 No approval or consent of, or certification, inspection, review, comment, verification, confirmation, acknowledgement or audit by, any governmental authority, *Owner*, or *Consultant*, or anyone on their behalf, shall relieve *Contractor* from performing or fulfilling any of its obligations under the *Contract*. Without limitation, whenever any drawings, plans, procedures, programs or other work product of *Contractor* requires any review, inspection, comment or approval by any governmental authority, *Owner*, or *Consultant*, or anyone on their behalf, any such review, inspection, comment or approval shall not, in any way, reduce or modify any of *Contractor’s* obligations under the *Contract*.
- 9.3 If any part of the *Contract* or the application of such part to any party, person or circumstance shall, to any extent, be invalid or unenforceable, the remainder of the *Contract*, or the application of such part to any other party, person or circumstance, shall not be affected thereby and each provision of the *Contract* shall be valid and enforceable to the fullest extent permitted by law.
- 9.4 The terms of the *Contract*, which by their nature are continuing, shall survive the termination or other expiration of the *Contract*.
- 9.5 This Agreement, including the *Contract Documents* described herein and the attachments, documents and other agreements to be furnished or executed in connection herewith, supersede all prior negotiations, representations or agreements, either written or oral, with respect to the subject matter hereof. No modification to the *Contract* shall be effective unless made in writing signed by both *Owner* and *Contractor*, unless otherwise provided for herein.
- 9.6 This Agreement may be executed in counterparts, each of which when executed and delivered, including any counterpart executed by a Party and transmitted by email by way of pdf attachment or facsimile transmission, shall be deemed an original, but all of which together will constitute one instrument binding upon the parties hereto, notwithstanding that all such parties may not have executed the same counterpart.”

- **DEFINITIONS**

- Add the following new definitions:

**“Commissioning**

*Commissioning* means the process of putting the *Work* or any part thereof into operation and includes StartUp, Verification and Performance Testing as described in the *Contract Documents*.

**Completion of Commissioning**

*Completion of Commissioning* means the point in time at which *Owner* and *Consultant* are satisfied that *Contractor* has successfully completed *Commissioning*.

**COVID-19**

*COVID-19* means the novel coronavirus infectious disease SARS-CoV-2 as referenced by the World Health Organization, including all related viruses, diseases, or variants, and any subsequent waves.

**Deficiency List**

*Deficiency List* means the deficiency list prepared by *Consultant* and/or *Owner*, acting reasonably, listing itemized deficiencies in the *Work* and errors and/or omissions in the *Design Services*.

**Dispute**

*Dispute* has the meaning ascribed in GC 8.1.1.

**Key Personnel**

*Key Personnel* means the project managers, superintendents, coordinators or other personnel of *Contractor*, if any, identified in Schedule “A” – Key Personnel to the *Contract*.

**OHSA**

*OHSA* means the *Occupational Health and Safety Act*, R.S.O. 1990 c. O.1, as amended, and all regulations passed thereunder.

**Scheduled Ready-for-Takeover Date**

*Scheduled Ready-for-Takeover Date* means [insert date].

**Scheduled Total Completion Date**

*Scheduled Total Completion Date* means [insert date].

- **Submittals**

*Submittals* are documents or other forms of information which *Contractor* is required to submit to *Owner* or *Consultant* and include, without limitation, *Shop Drawings*, samples, models, record drawings, test reports, certificates, diagrams and manuals.

**Total Completion of the Work**

*Total Completion of the Work Date* means the date that the *Work* is fully complete as prescribed by the *Contract Documents*, including, without limitation, the rectification of all defects and deficiencies.”

- **GENERAL CONDITIONS OF THE STIPULATED PRICE CONTRACT**

- Amend paragraph 1.1.3 by inserting “Applying the standard of care described in paragraph 1.5.1.1 of GC 1.5 - PROJECT REQUIREMENTS,” at the beginning of the first sentence.
- Amend paragraph 1.1.4 by inserting “Except for its obligations to review under GC 1.1.3 and to report under this GC 1.1.4,” at the beginning of the first sentence and by adding “Neither *Owner* nor *Consultant* will be responsible for oral instructions.” after the second sentence.
- Amend paragraph 1.1.5.1 by moving the reference to “Supplementary Conditions” to the top of the order of priority.
- Amend paragraph 1.1.5.1 by adding a new bullet called “Advance Payment Agreement” as the 2nd bullet point in the order of priority.
- Amend paragraph 1.1.9 by adding the following to the end of the paragraph:
- “The *Specifications* may be divided into Divisions and the Divisions into Sections for the purpose of convenience, but a Section may consist of work of more than one *Subcontractor* or *Supplier*. The *Specifications* are intended to be read as a whole.”
- “Drawings are intended to be read as a whole”.
- Delete paragraph 1.1.10 in its entirety and substitute new paragraph 1.1.10 as follows:  
  
“The design information furnished to *Contractor* as part of the *Contract Documents*, including the *Drawings* and *Specifications*, are the property of *Owner* and/or *Consultant*, and are to be used by *Contractor* only for the purposes of performing the *Work*. *Contractor* shall not copy, alter or utilize the aforesaid design information for any purpose unrelated to the *Work* without written authorization from *Owner* and *Consultant*.”
- Add new paragraph 1.1.12 as follows:
  - “1.1.12 The table of contents, titles, section headings, running headlines and marginal notes contained in the *Contract Documents* are solely to facilitate reference to various provisions of the *Contract Documents* and in no way affect or limit the interpretation or construction of the provisions to which they refer.”

#### GC 1.4 ASSIGNMENT

- Delete paragraph 1.4.1 in its entirety and insert the following:  
  
“1.4.1 *Contractor* shall not assign the *Contract* or any of its rights or interest in the *Contract*, nor shall *Contractor* subcontract all or substantially all of the *Work* or *Contractor’s* responsibilities under the *Contract* to a single

*Subcontractor* or any other person, without the prior written consent of *Owner*, which consent may not be unreasonably withheld. *Owner* may assign the *Contract* without the consent of *Contractor* upon providing *Notice in Writing* to *Contractor*.”

## GC 1.5 PROJECT REQUIREMENTS

- Add new paragraph 1.5.1:
  - “1.5.1 *Contractor* represents, covenants and warrants to *Owner* that:
    - it has the necessary high degree of experience and expertise required to perform the *Work* and it will in the performance of the *Work* exercise a standard of care, skill and diligence that would normally be provided by an experienced and prudent *Contractor* providing similar services for hospital projects of a similar nature;
    - the personnel it assigns to the *Project* are experienced and it has a sufficient staff of qualified and competent personnel to replace its designated *Contract* personnel referred to in GC 3.5, subject to *Owner’s* approval, in the event of death, incapacity, termination or resignation. The reference to *Owner’s* approval includes all named Subcontractors and their personnel.
    - there are no pending, threatened or anticipated claims or litigation involving *Contractor* that would have a material adverse effect on the financial ability of *Contractor* to perform the *Work*, and
    - it will achieve *Read-for-Takeover* and the *Total Completion Date* by the date set out in Article A1, paragraph 1.3.”

## • GC 2.2 ROLE OF THE CONSULTANT

- Add the following sentence to the end of paragraph 2.2.3:
  - “The presence of such project representatives at the *Place of the Work* or the *Work* shall not relieve *Contractor* from any responsibility to perform the *Work* as required by the *Contract Documents*.”
- Amend paragraph 2.2.5 by (a) adding the word “, schedules” after the word “techniques”, (b) adding the words “to *Contractor*” after the words “*Consultant* will not be responsible” in the first sentence, (c) adding to the following to the end of the second sentence “or to adhere to the construction schedule”, and (d) adding the following sentence to the end of the paragraph: “*Consultant* will not have control over, charge of or be responsible for the acts or omissions of *Contractor*, *Subcontractors*, *Suppliers*, or their agents, employees, or any other person performing any portion of the *Work*.”
- Amend paragraph 2.2.6 by deleting “Except with respect to GC 5.1 — FINANCING INFORMATION REQUIRED OF THE OWNER” and capitalizing “the”.

- Amend paragraph 2.2.7 by inserting “*Contractor* or *Owner* on its own behalf or on behalf of” after the word “by” in the second line.
- Amend paragraph 2.2.12 by (a) deleting the word “will” and replacing with “may”, and (b) adding the following sentence to end of the paragraph:
  - “*Contractor* shall be responsible for requesting any additional instructions or clarifications that may be required from *Consultant* which are needed for the performance of the *Work*, and shall request such instructions or clarifications in time to avoid any delay or additional cost of the *Work*.”
- Amend paragraph 2.2.13 by deleting “submittals” and replacing with “*Submittals*”.
- Amend paragraph 2.2.18 by deleting the words “immediately engage a *Consultant* against whom the *Contractor* makes no reasonable objection and” and replace with “engage a *Consultant*”.

## • **GC 2.3 REVIEW AND INSPECTION OF THE WORK**

- Amend paragraph 2.3.2 by inserting in line 1 “, *Commissioning*” after “inspections,”, and inserting in line 3 “and *Commissioning*” after “inspection”.
- Amend paragraph 2.3.3 by inserting in line 1 “, *Commissioning*” after “certificates”.
- Amend paragraph 2.3.4 by inserting in line 2 “*Commissioning*” after “inspections,”, and inserting in line 3 “or *Commissioning*” after “tests”.
- Amend paragraph 2.3.5 by inserting “Subject to paragraph 2.3.4” at the beginning of the third sentence.
- Amend paragraph 2.3.6 and paragraph 2.3.7 by inserting “or *Commissioning*” after “inspection” in all instances.

## • **GC 2.4 DEFECTIVE WORK**

- Amend paragraph 2.4.1 by (a) adding the words “or *Owner*” after the word “*Consultant*” in the first line, and (b) by adding the following to the end of the paragraph:
 

“*Contractor* shall rectify in a manner acceptable to *Owner* all other defective work and like deficiencies throughout the *Work* whether or not they are specifically identified by *Consultant*.”
- Amend paragraph 2.4.3 by deleting the words “the difference in value between the work as performed and that called for by the *Contract Documents*” and inserting the words “the value of such work as is necessary to correct any non-compliance with the *Contract Documents*.”
- Add new paragraphs 2.4.4, 2.4.5 and 2.4.6:

- “2.4.4 *Contractor* shall prioritize the correction of any defective work which, in the sole discretion of *Owner*, adversely affects the day to day operation of *Owner*.”
- 2.4.5 Upon notification of a defect in the *Work*, *Contractor* shall promptly, and no later than five (5) *Working Days*, provide a written statement outlining the proposed remedial measures and a schedule for implementation. Once approved by *Consultant*, *Contractor* shall proceed with the remedial measures without adversely affecting the construction schedule.
- 2.4.6 Notwithstanding any rejection of the *Work* by *Consultant* or *Owner*, or the deduction of an amount otherwise due to *Contractor* by *Owner* as a result of defective work, *Contractor* is required to continue the *Work* in accordance with the *Contract Documents*.”

### • **GC 3.1 CONTROL OF THE WORK**

- Amend paragraph 3.1.1 by inserting the words “schedule, coordinate and” after the word “effectively”.
- Amend paragraph 3.1.2 by adding the word “, schedules” after the word “techniques” and by adding the following to the end of the sentence: “and shall coordinate the *Work* so as not to interfere with, interrupt, obstruct, delay, or otherwise affect, the work of others”.
- Add new paragraph 3.1.3:
  - “3.1.3 Prior to commencing procurement, or fabrication construction activities, *Contractor* shall verify, at the *Place of the Work*, all relevant measurements and levels necessary for proper and complete fabrication, assembly and installation of the *Work* and shall further carefully compare such field measurements and conditions with the requirements of the *Contract Documents*. Where dimensions are not included or exact locations are not apparent, *Contractor* shall immediately notify *Consultant*, in writing, and obtain written instructions from *Consultant* before proceeding with any part of the affected work.”

### • **GC 3.2 CONSTRUCTION BY THE OWNER OR OTHER CONTRACTORS**

- Delete subparagraph 3.2.2.1 in its entirety and substitute the following: “Intentionally deleted”.
- Add new subparagraph 3.2.3.5:
  - “3.2.3.5 Subject to **GC 9.4 CONSTRUCTION SAFETY**, for *Owner’s* own forces and for *Other Contractors*, assume overall responsibility for compliance with all aspects of the applicable health and safety legislation in the *Place of the Work*, including all of the responsibilities of the constructor under the *OHSA*.”

- Delete the last sentence of paragraph 3.2.5.
- Delete paragraph 3.2.6 in its entirety and substitute the following:
- “Entry by *Owner*, *Owner’s* forces and/or by *Other Contractors* does not indicate acceptance of the *Work* and does not relieve *Contractor* of any responsibility under the *Contract* including the responsibility to complete the *Work*.”
- Add new paragraph 3.2.7 as follows:
  - “3.2.7 Placing, installing, application and connection of work by *Owner*, *Owner’s* own forces, and/or by *Other Contractors*, on and to the *Work* will not relieve *Contractor’s* responsibility to provide and maintain the specified warranties unless a defect has been created by *Owner*, *Owner’s* own forces or *Other Contractors*.”

### • **GC 3.3 TEMPORARY WORK**

- Add new paragraph 3.3.4 as follows:
  - “3.3.4 Temporary or trial usage of any mechanical device, machinery, apparatus, equipment or materials shall not be construed as evidence of acceptance of the same and no claim for damage shall be made by *Contractor* for damage to or breaking of any part of such work which may be used.”

### • **GC 3.4 CONSTRUCTION SCHEDULE**

- Delete paragraph 3.4.1 in its entirety and substitute new paragraph 3.4.1:
  - “3.4.1 *Contractor* shall,
    - unless it is required to be submitted earlier in accordance with the *Specifications*, then prior to submitting the first application for payment, submit to *Owner* and *Consultant* for their review and acceptance a construction schedule in electronic format and in hard copy, indicating the critical path for the *Project* demonstrating that the *Work* will be performed in conformity with the *Contract Time* and the *Contract Documents*. Once accepted by *Owner* and *Consultant*, the construction schedule submitted by *Contractor* shall become the baseline construction schedule;
    - provide the necessary expertise and resources (including, without limitation, personnel and equipment) as are necessary to maintain progress under the accepted baseline construction schedule referred to in paragraph 3.4.1.1 or any successor or revised schedule accepted by *Owner* pursuant to this GC 3.4;
    - monitor the progress of the *Work* on a weekly basis relative to the construction schedule, reviewed and accepted pursuant to paragraph 3.4.1.1, or any successor or revised schedule accepted



in writing by *Owner* pursuant to GC 3.4, update the construction schedule on a monthly basis and advise *Consultant* and *Owner* in writing of any variation from the baseline construction schedule or slippage in the baseline construction schedule; and

- if, after applying the expertise and resources required under paragraph 3.4.1.2, *Contractor* forms the view that the slippage in baseline construction schedule reported in paragraph 3.4.1.3 cannot be recovered by *Contractor*, it shall, in the same notice provided under paragraph 3.4.1.3, indicate to *Consultant* and *Owner* if *Contractor* intends to apply for an extension of *Contract Time* as provided in PART 6 CHANGES IN THE WORK.”

- Add new paragraph 3.4.2:

- “3.4.2 If at any time it should appear to *Owner* or *Consultant* that the actual progress of the *Work* is behind schedule or is likely to become behind schedule, or if *Contractor* has given notice to that effect to *Owner* or *Consultant* pursuant to 3.4.1.3, *Contractor* shall take appropriate steps to cause the actual progress of the *Work* to conform to the schedule and shall produce and present to *Owner* and *Consultant* a recovery plan demonstrating how *Contractor* will achieve the recovery of the schedule. *Owner* may instruct *Contractor*, at *Contractor’s* expense, to employ additional labour and equipment or work overtime or employ any other reasonable procedures, at no expense to *Owner*, to bring the *Work* back to conform with the schedule.”

- **GC 3.5 SUPERVISION**

- Add new paragraphs 3.5.3 and 3.5.4 as follows:

- “3.5.3 *Contractor* shall employ competent *Key Personnel* who will not be removed or replaced during the course of the *Work* without the prior written consent of *Owner*, which approval shall not be unreasonably withheld. Should any of *Contractor’s* personnel prove to be unacceptable to *Owner*, *Owner* shall give written notice to *Contractor* who shall, within seven (7) days of receipt of the written notice, make arrangements to appoint a replacement acceptable to *Owner*.
- 3.5.4 *Contractor’s* site superintendent for the *Contract* shall devote their full time during working hours to the *Project* and remain at the *Place of the Work* until a final certificate of payment has been issued by *Consultant* and all deficiencies in the *Work* have been rectified to the satisfaction of *Owner*. The fulltime site superintendent for the *Contract* shall be named in Schedule “A” – *Key Personnel* and any acceptable replacement shall represent *Contractor* at the *Place of the Work* and notices and instructions given to the site superintendent for the *Contract* by *Consultant* shall be held to have been received by *Contractor*.”

- **GC 3.6 SUBCONTRACTORS AND SUPPLIERS**

- Amend paragraph 3.6.2 by inserting the following at the end of the paragraph:
  - “*Contractor* agrees not to change those *Subcontractors* without prior written approval of *Owner*, acting reasonably. Where *Contractor* wishes to change any identified *Subcontractors* or *Suppliers*, *Contractor* shall set out in writing to *Owner* sufficient reasons for the desired change. *Owner* or *Consultant* shall advise *Contractor* if *Owner* agrees to the proposed change. If *Owner* is not satisfied with *Contractor*’s reason for wanting to change an identified *Subcontractor* or *Supplier*, *Contractor* shall be required to proceed with the identified *Subcontractor* or *Supplier*.”
- Amend 3.6.4 by inserting the following at the end of the paragraph:
  - “unless the request to change a proposed *Subcontractor* or *Supplier* is a result of issues with the ability of the *Subcontractor* or *Supplier* to complete the *Work* in a proper manner, in which case *Contractor* will not be entitled to any change in the *Contract Price* or *Contract Time*”.

### • **GC 3.7 LABOUR AND PRODUCTS**

- Add new paragraph 3.7.4:
  - “3.7.4 *Contractor* is responsible for the safe onsite storage of *Products* and their protection (including *Products* supplied by *Owner* and *Other Contractors* to be installed under the *Contract*) in such ways as to avoid dangerous conditions or contamination to the *Products* or other persons or property and in locations at the *Place of the Work* to the satisfaction of *Owner* and *Consultant*. *Owner* shall provide all relevant information on the *Products* to be supplied by *Owner*.”

### • **GC 3.8 SHOP DRAWINGS**

- Add the words “AND OTHER SUBMITTALS” to the title of GC 3.8 after “SHOP DRAWINGS”.
 

Add “and *Submittals*” after the words “*Shop Drawings*” in clauses 3.8.1, 3.8.2, 3.8.3, 3.8.3.2, 3.8.5, and 3.8.6.
- Amend paragraph 3.8.2 by adding the following sentence at the beginning of the paragraph:
  - “Prior to the first application for payment, *Contractor* and *Consultant* shall jointly prepare a schedule of the dates for submission and return of *Shop Drawings* and any *Submittals*.”
- Delete subparagraph 3.8.3.1 in its entirety and substitute new subparagraph 3.8.3.1:
 

“3.8.3.1 *Contractor* has determined, verified and correlated all field measurements with the *Shop Drawings* and any *Submittals* and field

construction conditions, *Product* requirements, catalogue numbers and similar data, or will do so if not possible at that time, and”

- Delete paragraph 3.8.7 and substitute the following:
  - “3.8.7 *Consultant* will review and return *Shop Drawings* and *Submittals* in accordance with the schedule agreed upon in paragraph 3.8.2, or, in the absence of such schedule, within fifteen (15) *Working Days*. If, for any reason, *Consultant* cannot process the *Shop Drawings* or *Submittals* within the agreedupon schedule or within fifteen (15) *Working Days*, *Consultant* shall notify *Contractor* and they shall meet to review and arrive at an acceptable revised schedule for processing. *Contractor* shall update the *Shop Drawings* and *Submittals* schedule to correspond to changes in the construction schedule.”

- **GC 3.9 DOCUMENTS AT THE SITE**

- Add a new GC 3.9 DOCUMENTS AT THE PLACE OF THE WORK as follows:
- **“GC 3.9 DOCUMENTS AT THE PLACE OF THE WORK**
  - 3.9 *Contractor* shall keep one copy of the current *Contract Documents*, *Supplemental Instructions*, *Contemplated Change Orders*, *Change Orders*, *Change Directives*, reviewed *Shop Drawings*, *Submittals*, reports and records of meetings at the *Place of the Work*, in good order and available to *Owner* and *Consultant*.” Should have progressive/current red line as-built drawings (double check).

- **GC 3.10 CLEAN UP**

- .1 Add a new GC 3.10 CLEAN UP as follows:
- **“GC 3.10 CLEAN UP**
  - 3.10.1 *Contractor* shall maintain the *Work* and *Place of the Work* in a safe and tidy condition and free from the accumulation of waste products and debris, other than that caused by *Owner*, *Other Contractors*, or their employees.
  - 3.10.2 Before applying for *Substantial Performance of the Work* as provided in GC 5.4 – SUBSTANTIAL PERFORMANCE OF THE WORK AND PAYMENT OF HOLDBACK, *Contractor* shall remove waste products and debris, other than that resulting from the work of *Owner*, *Other Contractors*, or their employees, and shall leave the *Place of the Work* clean and suitable for use or occupancy by *Owner*. *Contractor* shall remove products, tools, *Construction Equipment*, and *Temporary Work* not required for the performance of the remaining work.

- 3.10.3 Prior to application for the final payment, *Contractor* shall remove any remaining products, tools, *Construction Equipment*, *Temporary Work*, and waste products and debris, other than those resulting from the work of *Owner*, *Other Contractors*, or their employees.”
- **GC 3.11 USE OF THE WORK**
- .1 Add new GC 3.11 USE OF THE WORK as follows:
- **“GC 3.11 USE OF THE WORK**
  - 3.11.1 *Contractor* shall confine *Construction Equipment*, *Temporary Work*, storage of *Products*, waste products and debris, and operations of employees and *Subcontractors* to limits indicated by laws, ordinances, permits, or the *Contract Documents* and shall not unreasonably encumber the *Place of the Work*.
  - 3.11.2 *Contractor* shall not load or permit to be loaded any part of the *Work* with a weight or force that will endanger the safety of the *Work*.
  - 3.11.3 Except for those normally used during the performance of the *Work*, such as elevator, mechanical, electrical, hydro, *Contractor* shall not use any service plant or equipment installed as part of the *Work* without prior written consent from *Owner*. On receipt of such consent, *Contractor* shall be subject to any conditions set out as part of such consent and shall be responsible for all costs, damage and compensation for wear and tear.
  - 3.11.4 If storage or other areas are required for the *Work* in addition to the *Work Site*, *Contractor* shall be responsible for making arrangements to obtain the additional areas and obtaining any necessary permits, permission or authorization and, if required, for making permit, rental or other payments that may be required for such purpose.”
- **GC 4.1 CASH ALLOWANCES**
  - Delete paragraph 4.1.4 in its entirety and substitute new paragraph 4.1.4:
    - “4.1.4 Any surpluses in one or more cash allowance may at the election of *Owner* be expended pursuant to paragraph 4.1.3 in respect of other cash allowances or to fund changes in the *Work* by way of *Change Order* or *Change Directive*, as the case may be, but without the imposition of *Overhead* or profit in respect *Work* pertaining to such other cash allowances or changes.”
  - Delete paragraph 4.1.5 in its entirety and substitute new paragraph 4.1.5:
    - “4.1.5 Where the value of the *Work* under cash allowances exceeds the aggregate amount of all the cash allowances stated in the *Contract Documents*, *Contractor* shall be compensated for the approved amount of such excess and for *Overhead* and profit on such approved amount, with

the *Contract Price* being adjusted to reflect such excess, all pursuant to, and only to the extent permitted under, GC 6.1 - CHANGES, 6.2 - CHANGE ORDER and GC 6.3 - CHANGE DIRECTIVE.”

- Delete paragraph 4.1.7 in its entirety and substitute new paragraph 4.1.7:
  - “4.1.7 *Contractor* shall provide a schedule prior to the first application for progress payment that shows when the items called for under cash allowances must be ordered to avoid delaying the progress of the *Work*.”
- Add new paragraph 4.1.8:

“4.1.8 *Owner* reserves the right to call, or to have *Contractor* call, competitive bids for portions of the *Work*, to be paid for from cash allowances. If *Owner* determines to proceed with competitive bids, *Contractor* shall comply with the directions of *Owner*.”

#### • **GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER**

- Amend the heading, “GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER” to read, “GC 5.1 FINANCING INFORMATION REQUIRED”.
- Delete paragraph 5.1.1 in its entirety and substitute new paragraph 5.1.1:
  - “5.1.1 *Contractor* shall provide *Owner* with timely *Notice in Writing* of any material change in its financial ability to (a) properly complete the *Work* in accordance with the *Contract Documents* or (b) fulfil its obligations under the *Contract*.”
- Delete paragraph 5.1.2 in its entirety and substitute the following: “Intentionally deleted”.

#### • **GC 5.2 APPLICATIONS FOR PAYMENT**

- Amend paragraph 5.2.2 by adding the following sentence to the end of the paragraph: “Applications for payment shall be made in a form that is mutually acceptable to *Owner* and *Contractor*.”
- Amend paragraph 5.2.3 by deleting “delivered to” and substitute “incorporated into”.
- Amend paragraph 5.2.4 by inserting the following after the word “*Work*” in the second line: “in a format acceptable to *Owner* and *Consultant*”.
- Delete paragraph 5.2.7 in its entirety and substitute new paragraph 5.2.7:
  - “5.2.7 *Contractor* shall submit, with each application for payment, as a true conditions precedent to *Contractor’s* right to payment under this *Contract*:

- .1 evidence of compliance with workers' compensation legislation at the *Place of the Work*, including a Workplace Safety & Insurance Board Clearance Certificate;
  - .2 after the first payment, a statutory declaration by *Contractor* as to the distribution made of the amounts previously received, on an original form of Statutory Declaration CCDC Document 9A-2001, stating that payments in connection with the *Work*, as noted in the statutory declaration, have been made to the end of the period immediately preceding that covered by the current application; and
  - .3 if the application is for payment of the lien holdback amount, a written request for release of holdback including a declaration that no written notices of lien have been received by *Contractor*."
- Add to the end of paragraph 5.2.8 the following new sentence:  
  
"Any *Products* delivered to the *Place of the Work* but not yet incorporated into the *Work* shall remain at the risk of *Contractor* until *Ready-for-Takeover* notwithstanding that title has passed to *Owner* pursuant to GC 14.1 OWNERSHIP OF MATERIALS."
  - Add new paragraph 5.2.9:  
  
    - "5.2.9 *Contractor* shall prepare and maintain current asbuilt *Drawings* which shall consist of the *Drawings and Specifications* revised by *Contractor* during the *Work*, showing changes to the *Drawings and Specifications*, which current asbuilt *Drawings* shall be maintained by *Contractor* and made available to *Consultant* for review with each application for progress payment. *Consultant* reserves the right to retain a reasonable amount for the value of the asbuilt *Drawings* not presented for review."

• **GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK AND PAYMENT OF HOLDBACK**

- Amend paragraph 5.4.1 by deleting the words "20 calendar days" in the second line and substituting the words "fifteen (15) *Working Days*" therefor, and by adding the following at the beginning of the paragraph:  
  
  - "When *Contractor* considers that the *Work* is substantially performed, or if permitted by the lien legislation applicable to the *Place of the Work* a designated portion thereof which *Owner* agrees to accept separately is substantially performed, *Contractor* shall, within one (1) *Working Day*, deliver to *Consultant* and *Owner* a written application for payment of the lien holdback amount, in accordance with GC 5.3, for review by *Consultant* to establish *Substantial Performance of the Work* or substantial performance of the designated portion of the *Work*."

- Delete paragraph 5.4.2 in its entirety and substitute the following: “Intentionally deleted”.
- Delete paragraph 5.4.3 in its entirety and substitute new paragraph 5.4.3:
  - “5.4.3 Subject to the terms and conditions of the *Contract*, the requirements of any *Payment Legislation*, and any Notice of Non-Payment of Holdback, the holdback amount authorized by the certificate for payment of the holdback shall be due and payable on the first (1<sup>st</sup>) *Working Day* following the expiration of the holdback period stipulated in the *Payment Legislation* applicable to the *Place of the Work*. *Owner* may retain out of the holdback amount any sums required by law to satisfy any liens against the *Work* or, if permitted by the lien legislation applicable to the *Place of the Work*, other third party monetary claims against *Contractor* which are enforceable against *Owner*.”
- Amend paragraph 5.4.5 by deleting “hereby agrees to release, and shall release,” and substituting “may agree to release”.
- Add new paragraph 5.4.7 as follows:
 

“5.4.7 *Contractor* shall publish a copy of the Certificate of *Substantial Performance of the Work* within seven (7) days of receiving a copy of the Certificate of *Substantial Performance of the Work* signed by *Consultant*, and *Contractor* shall provide suitable evidence of the publication to *Consultant* and *Owner*. If *Contractor* fails to publish such notice, *Owner* shall be at liberty to publish and back charge *Contractor* its costs for doing so.”
- Add new paragraph 5.4.8 as follows:
 

“5.4.8 For the purposes of obtaining *Substantial Performance of the Work* and the lien legislation applicable to the *Place of the Work* relating to the meaning of substantial performance, the *Contractor* acknowledges that the improvements required by this *Contract*, cannot be considered “substantially completed” or “ready for use” until all items listed in paragraphs a) through j) below have been completed and/or provided in full. The *Contractor* agrees that its failure to submit all of the listed materials and documentation in conformance with the *Contract Documents* shall constitute proper grounds for the *Consultant* to reject the *Contractor’s* application for *Substantial Performance of the Work*.

  - (a) Submission of Warranties, Data Manuals and As-Built Drawings and Specifications in acceptable manner;
  - (b) Instruction of *Owner* in the operation of systems;
  - (c) Approval to occupy completed work, from authorities having jurisdiction;

- (d) Insurance advisory organization approval of sprinkler system received by *Consultant*;
- (e) Submission to and acceptance by the *Consultant* of interim accounts of the *Work* showing all additions and deletions to the *Contract Price*;
- (f) Elevator inspection and approval by governing authority received by *Consultant*;
- (g) All systems and equipment started up and tested including final balancing;
- (h) All life safety systems verified by *Contractor* and *Consultant* as complying with the requirements of the *Contract Documents*;
- (i) Local fire authority has inspected and confirmed that life safety systems are acceptable.
- (j) All spare parts and maintenance materials.

and any other materials or documentation required to be submitted under the *Contract*, together with written proof acceptable to the *Owner* and the *Consultant* that the *Work* is substantially performed in accordance with the requirements of the *Contract Documents*, lien legislation applicable to the *Place of the Work*, and the municipal government, utilities and other authorities having jurisdiction.”

- **GC 5.5 FINAL PAYMENT**

- Delete paragraph 5.5.1 in its entirety and substitute new paragraph 5.5.1:
  - “5.5.1 When *Contractor* considers that the *Work* is completed and satisfies the requirements of *Total Completion of the Work* and *Completion of Commissioning*, *Contractor* shall submit an application for final payment. *Contractor’s* application for final payment shall be accompanied by any documents or materials not yet delivered as agreed to in writing by *Owner* pursuant to paragraph 12.1.2 of GC 12.1 - READY-FOR-TAKEOVER together with fully complete asbuilt *Drawings*. Should *Contractor* fail to deliver any of the said documents, or other documents required to be delivered pursuant to the *Contract Documents*, *Owner* shall be at liberty to withhold from amounts otherwise payable to *Contractor*, an amount, in the discretion of *Owner*, up to the full amount otherwise payable to *Contractor* as security for the obligation of *Contractor* to deliver the undelivered documents.”
- Delete from the first line of paragraph 5.5.2 the words, “calendar days” and substitute the words “*Working Days*”.



- Delete paragraph 5.5.4 in its entirety and substitute new paragraph 5.5.4:
  - “5.5.4 Subject to the other requirements of the *Contract*, the unpaid balance of the *Contract Price* shall become payable to *Contractor* on the tenth (10<sup>th</sup>) *Working Day* following the issuance of *Consultant’s* final certificate for payment, subject to *Owner’s* right to withhold payment from the unpaid balance of the *Contract Price* for any amounts required pursuant to GC 5.6 DEFERRED WORK, and any sums required to satisfy any lien or trust claims arising from the *Work*”.
- Add new paragraph 5.5.5:
  - “5.5.5 As additional preconditions for release of the final payment, *Contractor* shall submit the following documentation:
    - *Contractor’s* written request for release of final payment, including a declaration that no written notices of lien have been received by it;
    - *Contractor’s* Statutory Declaration CCDC 9A2001; and
    - *Contractor’s* Workplace Safety & Insurance Board Clearance Certificate.”

• **GC 5.6 DEFERRED WORK**

- Add new paragraph GC 5.6.2:
  - “5.6.2 Notwithstanding the provisions of GC 5.3 PAYMENT, GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK AND PAYMENT OF HOLDBACK and GC 5.5 FINAL PAYMENT, *Owner* may withhold payment of any amounts otherwise due under the *Contract* on account of any costs or damages *Owner* has incurred or, is likely to incur, by reason of:
    - defective or incomplete portions of the *Work* or damage to the work of *Other Contractors* not rectified in accordance with the *Contract*;
    - failure of *Contractor* to indemnify *Owner* in accordance with the terms of the *Contract*;
    - failure of *Contractor* to fulfil its obligations in respect of construction liens in accordance with GC 14.2 CONSTRUCTION LIENS;
    - evidence of *Contractor’s* failure to make payments to *Subcontractors* or *Suppliers*;
    - unsatisfactory prosecution of the *Work* by *Contractor* or any *Subcontractor*, and

- failure to attain the *Contract Time*.”

Add new paragraph GC 5.6.3:

“5.6.3 Where *Owner* has withheld payment of any portion of the *Contract Price* pursuant to the provision of paragraphs 5.6.1 or 5.6.2, *Owner* shall be entitled to apply such withheld portion towards any costs or damages suffered by *Owner*.”

## • **GC 6.1 OWNER’S RIGHT TO MAKE CHANGES**

- Add the following new paragraphs:

- “6.1.3 *Contractor* shall not be entitled to receive any compensation or extension of *Contract Time*, and *Owner* shall have no obligation or liability to pay compensation to *Contractor*, unless a *Change Order* or *Change Directive* has been issued to *Contractor*, in writing, and before *Contractor* commences with any work in respect of such *Change Order* or *Change Directive*.

- 6.1.4 There shall be no adjustment to the *Contract Time* should *Contractor* fail to present a request for a specific adjustment to the *Contract Time*, if any:

- .1 at the time of first presenting a request for adjustment to the *Contract Price* in response to a *Contemplated Change Order*; or
- .2 within ten (10) *Working Days* of receipt of a *Change Directive*.

- 6.1.5 There shall be no adjustments to the *Contract Time* or *Contract Price* or compensation or payment of any kind whatsoever including potential or contingent costs for matters such as loss of profit, loss of productivity, loss of opportunity or any other such losses based on the quantity, scope or cumulative value or number of changes in the *Work* whether resulting from one or more *Change Orders* or *Change Directives*, unless agreed in writing by the parties in a *Change Order*.

- 6.1.6 There shall be no adjustments to the *Contract Time* or *Contract Price* or compensation or payment of any kind whatsoever relating to a *Contractor* claim unless notice in writing of the claim is given to *Owner*, through *Consultant* not later than twenty (20) *Working Days* after *Contractor* becomes aware of the claim.

- 6.1.7 Any *Change Order* or *Change Directive* shall clearly set out what, if any, extension of the *Contract Time* is anticipated as a result thereof and failing the inclusion of the same, *Contractor* shall be barred in making a claim for extension of the *Contract Time* in respect thereof.

- 6.1.8 With respect to the valuation of any adjustment in the *Contract Price*, subject to any different or additional requirements contained in the *Contract Documents*, the following shall apply:
  - if applicable, unit prices included in the *Contract*, or prices pro rata thereto, will be used to value changes;
  - proposed methods of adjustment should contain itemized breakdowns describing the net actual value of the *Work* (excluding *Value Added Taxes*), *Contractor's* markup for overhead and profit, the markup for overhead and profit of *Subcontractors*, and where appropriate, detailed quotations or cost vouchers from *Subcontractor* and *Suppliers*;
  - all overhead costs are deemed to include both site and head office overhead costs, as well as any applicable insurance and bonding costs;
  - labour costs shall be the actual labour costs based upon rates prevailing at the *Place of the Work* and payable to workers, plus applicable statutory charges such as Workplace Safety & Insurance Board coverage, Employment Insurance, Canada Pension, vacation pay, and hospitalization and medical insurance; and
  - if a change involves both additions and deletions to the *Work*, the value of the change will be determined based upon the net difference to the *Work* occasioned by the change. For greater certainty, *Contractor's* markup for overhead and profit only will be applied to the net value of the change.
- 6.1.9 *Owner*, through *Consultant*, reserves the right to authorize payment for a change in the *Work* by means of *Cash Allowance*. For greater certainty, *Contractor* is not entitled to any markup for overhead and profit on such amounts.”

## GC 6.2 CHANGE ORDER

- Delete paragraph 6.2.1 inserting new paragraph 6.2.1 as follows:
  - “6.2.1 When a change in the *Work* is proposed or required, *Consultant* or *Owner* shall provide a notice describing the proposed change in the *Work* to *Contractor*. *Contractor* shall provide:
    - a quotation from the *Contractor*, on the *Contractor's* letterhead and with *Contractor's* signature;
    - quotations from all *Subcontractors*, each on *Subcontractor's* respective letterhead and with *Subcontractor's* respective signature; and

- the following information in quotations from *Subcontractors* and *Contractor*:
  - (1) a complete breakdown for all items of material;
  - (2) a total number of hours for labour;
  - (3) a dollar rate applied against individual material items and labour quantities;
  - (4) stipulated adjustment in the *Contract Time*, if any, for the proposed change in the *Work*;
  - (5) percentage values for overhead and profit by *Contractor* and *Subcontractors*; and
  - (6) all mathematical calculations, which shall be complete.
- Quotations submitted with any of the above items or information in this paragraph 6.2.1 missing or incorrect will be returned for revision.”
- Add new GC 6.2.3 as follows:
- “6.2.3 *Owner* and *Contractor* acknowledge and agree that *Contractor* shall not be entitled to any mark-ups for overhead and profit on any changes in the *Work*, save and except for the following:
  - .1 for changes to the *Work* with a value of less than or equal to \$50,000, *Contractor* shall be entitled to mark-ups for overhead and profit of ten percent (10%) on work performed by *Contractor’s* own forces plus five percent (5%) on work performed by *Subcontractors*; and
  - .2 for changes to the *Work* with a value greater than \$50,000, *Contractor* shall be entitled to mark-ups for overhead and profit of seven and a half percent (7.5%) on work performed by *Contractor’s* own forces plus five percent (5%) on work performed by *Subcontractors*.”
  - .3 for changes to the *Work* for any value, a *Subcontractor* shall be entitled to mark-ups for overhead and profit of ten percent (10%) on work performed by *Subcontractor’s* own forces.
  - .4 If *Subcontractor* retains another subcontractor (“sub-subcontractor”), no additional mark-up shall be charged to the *Owner* for the sub-subcontractor’s work.

- **GC 6.3 CHANGE DIRECTIVE**

- Amend paragraph 6.3.7.1 by (a) adding the following to the end of sub-paragraph (1) “carrying out the *Work*, including necessary supervisory services”, and (b) deleting sub-paragraphs (2), (3) and (4) in their entirety.
- Delete paragraphs 6.3.7.5, 6.3.7.11, 6.3.7.15 and 6.3.7.19.

- **GC 6.4 CONCEALED OR UNKNOWN CONDITIONS**

- Amend paragraph 6.4.1 by (a) deleting the first line and replacing with “If *Contractor* discovers conditions at the *Place of the Work* that, in *Contractor’s* opinion, are:” and (b) deleting the final two lines and replacing with “then *Contractor* shall give *Notice in Writing* to *Owner* and *Consultant* of such conditions before they are disturbed and in any event no later than two (2) *Working Days* after first observance of the conditions.”
- Add new paragraphs 6.4.5 and 6.4.6 as follows:
  - “6.4.5 *Contractor* confirms that, prior to entering into the *Contract*, applying the standard of care described in paragraph 1.5.1.1 of GC 1.5 - PROJECT REQUIREMENTS, it carefully investigated the *Place of the Work*. Notwithstanding any other provision in the *Contract*, *Contractor* is not entitled to compensation or to an extension of the *Contract Time* for conditions which could reasonably have been ascertained by *Contractor* by such investigation undertaken prior to the submission of the bid.
  - 6.4.6 *Contractor* shall not be entitled to claim, and waives its rights to make a claim, for any additional compensation or any increase to the *Contract Time* or *Contract Price*, if *Contractor* fails to provide notice to *Owner* as required in paragraph 6.4.1.”

- **GC 6.5 DELAYS**

- Add the following to the end of paragraphs 6.5.1 and 6.5.2: “but excluding any special, indirect or consequential losses or damages, including but not limited to, loss of use, loss of productivity, loss of revenue, overhead and/or profit”.
- Add the following to the end of paragraph 6.5.3: “and provided that such costs are reasonable (and, in any event, shall exclude any special, indirect or consequential losses or damages, including but not limited to, loss of use, loss of productivity, loss of revenue, overhead and/or profit).”
- Amend paragraph 6.5.3.3 by adding “epidemics or pandemics (except for *COVID-19*),” after the word “conditions,”
- Add new paragraphs 6.5.6, 6.5.7 and 6.5.8:
  - “6.5.6 *Contractor* shall assume any and all known conditions of *COVID-19* at the time of the execution of this *Contract* during and throughout the performance of the *Work*. Where there is any delay to the *Contract Time*

and/or *Project* or increase to the cost of the *Work*, caused by, resulting from, or related to any stop work order, legislation, measures, or direction, issued by any governmental authority having jurisdiction over the *Project*, in respect to, related to, or resulting from *COVID-19* which arises after the execution of this *Contract*, then:

- .1 *Contractor* shall be entitled to an extension of the *Contract Time* for a reasonable time caused by such stop work order, other order, measure, or direction; and
- .2 *Contractor* shall not be entitled to any increase in compensation whatsoever, including, without limitation, any (a) increase to the *Contract Price*, payment of (b) costs, expenses or damages, and/or (c) any indirect, consequential, or special damages, such as loss of profits, loss of opportunity or loss of productivity.
- 6.5.7 *Contractor* shall at all times perform the services required to perform the *Work* in accordance with the *Contract Documents* diligently and expeditiously, to maintain an orderly progress of the *Work*, and in conformity with the *Contract Time* and any revisions made thereto in accordance with the *Contract Documents*. *Contractor* shall at all times provide sufficient personnel to accomplish its services within the *Contract Time*.
- 6.5.8 If *Contractor* is delayed in the performance of the *Work* by an act or omission of *Contractor* or anyone employed or engaged by *Contractor* directly or indirectly, or by any cause within *Contractor's* control, then *Contractor* shall take appropriate steps, in accordance with paragraph 3.4.2 of GC 3.4 - CONSTRUCTION SCHEDULE, to recover any lost time, and the costs of such recovery efforts shall be to *Contractor's* account. To the extent that *Contractor* caused delay results in *Owner* incurring additional costs and expenses and/or a change in the *Contract Time*, *Contractor* shall be liable to *Owner* for *Owner's* cost and damages arising therefrom, including but not limited to, all services required by *Owner* from *Consultant* as a result of such delay by *Contractor* and, in particular, the cost of *Consultant's* services during the period between the date of *Ready-for-Takeover* stated in Article A1 herein as the same may be extended through the provision of these General Conditions and any later, actual date of *Ready-for-Takeover* achieved by *Contractor*."

#### • **GC 6.6 CLAIMS FOR A CHANGE IN CONTRACT PRICE**

- In paragraph 6.6.5, delete "claim" in the second line and substitute "necessary claim information".
- Add new paragraphs 6.6.7 and 6.6.8 as follows:
  - "6.6.7 *Owner* may make claims arising out of the costs incurred for additional services provided by *Consultant* resulting from *Contractor's* failure to perform the *Work* in accordance with the terms and conditions

of the *Contract*, including *Contractor's* issuance of unnecessary requests for information. *Consultant* will notify *Owner* and *Contractor* where it has been determined that additional services will be required or have been provided in order not to cause a delay. *Owner* shall make claims against *Contractor* based on *Consultant's* invoices.

- 6.6.8 *Contractor* shall not make claims arising out of any *COVID-19* conditions known at the time of the execution of this *Contract*.”

- **GC 7.1 OWNER’S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR’S RIGHT TO CONTINUE WITH THE WORK OR TERMINATE THE CONTRACT**

- .1 Amend paragraph 7.1.2 by (a) adding the words “or *Owner* determines that sufficient cause exists to justify such action,” in line three after the words “substantial degree”, and (b) deleting the words “including references to applicable provisions of the *Contract*”.
- .2 Delete paragraph 7.1.5.2 and insert new paragraph 7.1.5.2 as follows:  
“7.1.5.2 withhold further payment to *Contractor* until *Owner* has completed all *Work* required by the *Contract Documents* and satisfied any of its costs or damages resulting from *Contractor's* default,”
- .3 Amend paragraph 7.1.5.3 by deleting the words “as certified by the *Consultant*”.

- **GC 7.2 CONTRACTOR’S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT**

- Amend paragraph 7.2.2 by (a) adding the words “or related to *COVID-19*” after the first instance of the word “*Contractor*” in the third line, and (b) adding the following second sentence at the end of the paragraph: “If the *Work* is suspended or otherwise delayed as a result of *COVID-19* for a period of ninety (90) *Working Days*, *Contractor* may, upon giving *Owner* twenty (20) days *Notice in Writing*, terminate the *Contract*.”
- Delete subparagraph 7.2.3.1 in its entirety and substitute the following: “Intentionally deleted”.
- Delete subparagraph 7.2.3.3 in its entirety and substitute the following:  
“7.2.3.3 *Owner* fails to pay *Contractor* when due the amount certified by *Consultant* or awarded by adjudication, arbitration or a court, except where *Owner* has a bona fide claim for set off, or”
- Delete from line 2 of subparagraph 7.2.3.4, the words, “except for GC 5.1 – FINANCING INFORMATION REQUIRED OF THE OWNER”.
- Amend paragraph 7.2.4 by deleting “5” and substitute “fifteen (15)”.

- Amend paragraph 7.2.5 by (a) deleting “reasonable profit” in line 2, (b) deleting the words “damages” in line 3 and replace with the words “direct and demonstrable costs and expenses”, and (c) by adding the following to the end of the paragraph: “but excluding any special, indirect or consequential losses or damages, including but not limited to, loss of use, loss of productivity, loss of revenue, overhead and/or profit”.
- Add the following new paragraph 7.2.6:
  - “7.2.6 *Owner’s* withholding of progress payments, holdback payment and/or final payments pursuant to GC 5.6 shall not constitute a default under paragraph 7.2.3 permitting *Contractor* to stop the *Work* or terminate the *Contract*.”

## • **GC 8.1 AUTHORITY OF THE CONSULTANT**

- Delete paragraphs 8.1.1, 8.1.2 and 8.1.3 and substitute the following:
  - “8.1.1 Differences between *Owner* and *Contractor* as to the interpretation, application, or administration of this *Contract*, or any failure to agree where agreement between the parties is called for in the *Contract* (the “*Dispute*”) which are not resolved in the first instance by finding of *Consultant* pursuant to the provisions of GC - 2.2 ROLE OF THE CONSULTANT, paragraphs 2.2.6 and 2.2.7 shall be settled in accordance with the requirements of this GC 8.1.
  - 8.1.2 The claimant shall give written notice of the *Dispute* (“*Notice of Dispute*”) to the other party no later than seven (7) days after the receipt of *Consultant’s* finding given under paragraphs 2.2.7 or 2.2.8 of GC 2.2 ROLE OF THE CONSULTANT. The *Notice of Dispute* shall set forth particulars of the matters in dispute, the probable extent and value of the damage, and the relevant provisions of the *Contract Documents*. The other party shall reply within seven (7) days of receipt of the *Notice of Dispute*, or such longer period as mutually agreed by the parties in writing, setting out the response and any relevant provisions of the *Contract Documents*.
  - 8.1.3 The parties shall make all reasonable efforts to resolve the *Dispute* by amicable negotiations and agree to provide, without prejudice, full, frank, candid, and timely disclosure of relevant facts, information and documents to facilitate the negotiations.
  - 8.1.4 If the *Dispute* is not resolved promptly by amicable negotiations in accordance with GC 8.1.3, *Consultant* may provide instructions that, in *Consultant’s* opinion, are necessary for the proper performance of the *Work* and to prevent delays pending settlement of the *Dispute*. The parties shall act immediately according to such instructions, it being understood that by so doing neither party will jeopardize any claim they may have. If it is subsequently determined that such instructions were in error or at variance with the *Contract Documents*, *Owner* shall pay *Contractor* verifiable costs incurred by *Contractor* in carrying out such instructions, which *Contractor* was required to do beyond what the *Contract*



*Documents* correctly understood and interpreted would have required *Contractor* to do including costs resulting from interruption of the *Work*.

- 8.1.5 It is agreed that no act by either party shall be construed as a renunciation or waiver of any of their rights or recourses, provided the party has given the notices in accordance with paragraph 8.1.2 and has carried out the instructions as provided in paragraph 8.1.4, if any.
- 8.1.6 If the parties have not been able to resolve the *Dispute* in accordance with paragraph 8.1.3, the parties may agree to submit the *Dispute* to be finally resolved by arbitration under the rules of arbitration as provided in CCDC 40 in effect at the time of the execution of the *Contract*.
- 8.1.7 If no agreement is made for arbitration, then either party may submit the *Dispute* to such judicial tribunal as the circumstances may required.”

- **GC 8.3 NEGOTIATION, MEDIATION AND ARBITRATION**

- Delete 8.3 in its entirety and substitute the following: “Intentionally deleted”.

- **GC 8.4 RETENTION OF RIGHTS**

- Amend paragraph 8.4.2 by deleting “paragraph 8.3.6 of GC 8.3 – NEGOTIATION, MEDIATION AND ARBITRATION” and substituting “GC 8.1 – AUTHORITY OF THE CONSULTANT”.
- Add new paragraph 8.4.3:
  - “8.4.3 If the parties agree under paragraph 8.1.6 of GC 8.1 - AUTHORITY OF THE CONSULTANT to have a *Dispute* resolved by arbitration, *Contractor* agrees that this paragraph 8.4.3 shall be construed as a formal consent to the stay of any lien proceedings until an award is rendered in the arbitration or such *Dispute* is otherwise resolved between the parties; provided, however, that in no event shall *Contractor* be deprived of its right to enforce its lien against the *Project* should *Owner* fail to satisfy any arbitral award. For greater certainty, nothing in this paragraph 8.4.3 shall prevent *Contractor* from taking the steps required by the *Construction Act*, RSO 1990, c C.30 to preserve and/or perfect a lien to which it may be entitled.”

- **GC 9.1 PROTECTION OF WORK AND PROPERTY**

- Delete subparagraph 9.1.1.1 in its entirety and substitute new subparagraph 9.1.1.1:
  - “9.1.1.1 errors or omissions in the *Contract Documents* which *Contractor* could not have reasonably discovered applying the standard of care described in paragraph 1.5.1.1 of GC 1.5 - PROJECT REQUIREMENTS;”

- Delete paragraph 9.1.2 in its entirety and substitute the following new paragraph 9.1.2:
  - “9.1.2 Before commencing any *Work*, *Contractor* shall determine the locations of all underground utilities and structures indicated in or reasonably apparent or determinable from the *Contract Documents* or that are reasonably discoverable by applying an inspection of the *Place of the Work* to the degree of care and skill described in paragraph 1.5.1.1 of GC 1.5 - PROJECT REQUIREMENTS.”
- Add new paragraph 9.1.5:
  - “9.1.5 *Contractor* shall neither undertake to repair and/or replace any damage whatsoever to the *Work* of *Other Contractors*, or to adjoining property, nor acknowledge the same was caused or occasioned by *Contractor*, without first consulting *Owner* and receiving written instructions as to the course of action to be followed from either *Owner* or *Consultant*. However, where there is danger to life or public safety, *Contractor* shall take such emergency action as it deems necessary to remove the danger.”

## • **GC 9.2 TOXIC AND HAZARDOUS SUBSTANCES**

- Add new paragraph 9.2.5.5 as follows:
  - “.5 comply with *Owner’s* requirements and specifications for *hazardous substances* contained in the *Contract Documents*.”
- Add to paragraph 9.2.6 after the words “is responsible”, the following:
  - “or whether any toxic or *hazardous substances* or materials already at the *Place of the Work* (and which were then harmless or stored, contained or otherwise dealt with in accordance with legal and regulatory requirements) were dealt with by *Contractor* or anyone for whom *Contractor* is responsible in a manner which does not comply with legal and regulatory requirements, or which threatens human health and safety or the environment, or material damage to the property of *Owner* or others,”
- Add to paragraph 9.2.7 after the words “is responsible”, the following:
  - “or that any toxic or *hazardous substances* or materials already at the *Place of the Work* prior to *Contractor* commencing the *Work* (and which were then harmless or stored, contained or otherwise dealt with in accordance with legal and regulatory requirements) were dealt with by *Contractor* or anyone for whom *Contractor* is responsible in a manner which does comply with legal and regulatory requirements,”
- Add to paragraph 9.2.8 after the words “is responsible”, the following:
  - “or that any toxic or *hazardous substances* or materials already at the *Place of the Work* prior to *Contractor* commencing the *Work* (and which

were then harmless or stored, contained or otherwise dealt with in accordance with legal and regulatory requirements) were dealt with by *Contractor* or anyone for whom *Contractor* is responsible in a manner which does not comply with legal and regulatory requirements, or which threatens human health and safety or the environment, or material damage to the property of *Owner* or others,”

- Add “and *Consultant*” after the word “*Owner*” in subparagraph 9.2.8.4.

- **GC 9.4 CONSTRUCTION SAFETY**

- Delete paragraphs 9.4.1 to 9.4.5 and substitute the following:

- “9.4.1 *Contractor* shall be solely responsible for construction safety at the *Place of the Work* and for compliance by it and its *Subcontractors* and *Suppliers* with the applicable construction health and safety legislation, and *Owner’s* Safety and Infection Control Regulations, Guidelines and Instructions for *Contractors*. *Contractor* shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the *Work*. *Contractor* shall be deemed to be the, accepts the designation of, “constructor” as defined in the *OHSA* for the *Project*, and responsibility for the obligations and liabilities associated therewith. Prior to the commencement of the *Work*, *Contractor* shall submit to *Owner* a copy of the Notice of Project filed with the Ministry of Labour in respect of the *Work*.
- 9.4.2 Prior to the commencement of the *Work*, *Contractor* shall submit to *Owner*:
  - a current Workplace Safety & Insurance Board Clearance Certificate;
  - copies of *Contractor’s* insurance policies having application to the *Project* or certificates of insurance, at the option of *Owner*;
  - documentation of *Contractor’s* inhouse safetyrelated programs; and
  - a copy of the Notice of Project filed with the Ministry of Labour naming itself as “constructor” under *OHSA*.
- 9.4.3 *Contractor* hereby represents and warrants to *Owner* that appropriate health and safety instruction and training have been provided and will be provided to *Contractor’s* employees and *Subcontractors*, *Suppliers* and any one for whom *Contractor* is responsible, before the *Work* is commenced and agrees to provide to *Owner*, if requested, proof of such instruction and training.
- 9.4.4 *Contractor* shall tour the appropriate area to familiarize itself with the job site prior to commencement of the *Work*.

- 9.4.5 *Contractor* shall never work in a manner that may endanger anyone.
- 9.4.6 *Owner* has authority, but not the obligation, to stop the progress of the *Work* whenever in the reasonable opinion of *Owner* or *Consultant* such stoppage is necessary to ensure the safety of life, or of the *Work* or of neighbouring property.
- 9.4.7 *Contractor* shall indemnify and save harmless *Owner*, *Consultant* and their respective agents, officers, directors, employees, consultants, successors and assigns from and against any and all liability, cost, damage or loss, including legal fees and fines, related to or arising out of any and all acts or omissions of *Contractor*, its *Subcontractors*, *Suppliers*, employees, agents or representatives which contravene *Contractor*'s duties and obligations, as constructor, pursuant to the *OHS Act*, including the payment of legal fees and disbursements on a solicitor and client basis.
- 9.4.8 Without limiting the generality of paragraph 9.4.7, *Contractor*,
  - .1 agrees to waive and release *Owner* and its agents, officers, directors, employees, successors and assigns from any and all claims, demands, losses, costs, damages, actions, suits, or proceedings as against; and
  - .2 shall indemnify and save harmless *Owner*, *Consultant* and their respective agents, officers, directors, employees, successors and assigns, from and against any and all claims, demands, losses, costs, damages, actions, suits, or proceedings by any *Contractor*'s employees, *Subcontractors*, *Suppliers*, and/or third parties,
- that arise out of, are caused or contributed by, or are attributable to *COVID-19*, including and without limiting the generality of the foregoing, any claims, demands, losses, costs, damages, actions, suits or proceedings arising from, caused or contributed by, or attributable to *COVID-19* outbreaks originating from or on *Owner*'s premises.
- 9.4.9 In the event that *Owner* engages *Other Contractors* at the *Place of the Work* or performs work with its own forces *Owner* undertakes to include in its contracts with *Other Contractors* and/or in its instructions to its own forces the requirement that the *Other Contractors* or own forces, as the case may be, must comply with directions and instructions from *Contractor* as "constructor" with respect to occupational health and safety and related matters."

#### • GC 9.5 MOULD

- Delete paragraph 9.5.3.3 in its entirety and substitute new paragraph 9.5.3.3 as follows:
  - “9.5.3.3 extend the *Contract Time* for such reasonable time as *Consultant* may recommend in consultation with *Contractor*. If, in the opinion of

*Consultant, Contractor* has been delayed in performing the *Work* and/or has incurred additional costs under paragraph 9.5.1.2, *Owner* shall reimburse *Contractor* for its reasonable costs incurred as a result of the delay as certified by *Consultant*, and”

• **GC 10.1 TAXES AND DUTIES**

• Add new paragraphs 10.1.3, 10.1.4 and 10.1.5:

- “10.1.3 *Owner* shall be entitled to all available refunds or rebates of all taxes and custom duties applicable to the *Contract*, and *Contractor* shall cooperate with *Owner* in ascertaining the amount of such tax and custom duties and if necessary claim on its own behalf and transfer to *Owner* or facilitate a direct claim by *Owner* for any such available refund or rebate.
- 10.1.4 *Contractor* acknowledges and agrees that, at the time of execution of this *Contract*, it has taken into consideration in the *Contract Price* all known taxes and duties, including all tariffs that are currently in force and that may reasonably come into force during the progression of this *Contract*.
- 10.1.5 Notwithstanding paragraph 10.1.2, to the extent the *Contractor* imports or attains *Products* or other materials from outside of Canada (“*International Products*”), and any tariffs are increased or placed upon such *International Products* after the execution of this *Contract* for which the *Contractor* intends to seek reimbursement from the *Owner*, including any change to the *Contract Price Work*, then:
  - .1 *Contractor* shall provide notice to *Owner* of any increased or new tariffs on *International Products*, as soon as *Contractor* becomes aware of such tariffs, including the amount of such tariffs, and the particular *International Products* to which the tariffs apply.
  - .2 *Contractor* shall take all reasonable steps to seek out and locate alternatives in Canada or elsewhere for the *International Products* that comply with the *Contract Documents*, but would reduce or eliminate the impact of any such tariffs (the “*Alternative Products*”). If no *Alternative Products* are available, *Contractor* shall advise *Owner*, including explanation for the same.
  - .3 *Contractor* shall provide the *Owner* with a summary (the “*Tariff Proposal*”) setting out information that the *Owner* reasonably requires to consider proceeding with the *International Products* or *Alternative Products*, including, without limitation, any proposed change to the *Contract Price* and/or *Contract Time* resulting from the tariffs if the *Contractor* continues with the *International Products*, as compared to the *Contractor* proceeding with the *Alternative Products*.
  - .4 *Owner* shall have ten (10) *Working Days* from the receipt of the

*Tariff Proposal*, or such longer period as may be agreed in writing by the parties, to (a) select whether to have the *Contractor* continue with the *International Products* or proceed with the *Alternative Products*, which selection shall be recorded in a *Change Order*, or (b) request additional information reasonably required for the *Owner* to make such decision from the *Contractor*. The *Contractor* shall provide any additional requested information to the *Owner* as soon as possible, and the *Owner* shall have ten (10) *Working Days* from the submission of such information to make its selection. Any change to the *Contract Price* and/or *Contract Time*, shall apply on a go forward basis from the date of the *Change Order*, unless otherwise agreed by the parties and expressly set out in the *Change Order*. For clarity, the *Owner* shall not be responsible for paying to the *Contractor* the cost of any increased or new tariffs on any *International Products*, nor shall the costs of any increased or new tariffs form a change to the *Contract Price*, for amounts incurred prior to the issuance of the *Change Order*, as described in this paragraph 10.1.5.

- **GC 10.2 LAWS, NOTICES, PERMITS, AND FEES**

- Add to the end of paragraph 10.2.4, the following words:

“*Contractor* shall notify the Chief Building Official or the registered code agency where applicable, of the readiness, substantial completion, and completion of the stages of construction set out in the Ontario Building Code. *Contractor* shall be present at each site inspection by an inspector or registered code agency as applicable under the Ontario Building Code.”

- Delete from the first line of paragraph 10.2.5 the word, “The” and substitute the words “Subject to paragraphs 1.1.3 and 1.1.4 of GC 1.1 - GENERAL CONDITIONS OF THE STIPULATED PRICE CONTRACT, the”.
- Amend paragraph 10.2.7 by (a) deleting “bid closing” and substituting “execution of the *Contract*”, and (b) adding the following to the end of the paragraph: “, save and except for changes related to *COVID-19* which are provided for under paragraph 6.5.6 of GC 6.5 - DELAYS.”

- **GC 12.1      READY-FOR-TAKEOVER**
  - Amend paragraph 12.1.1.1 by adding “, and all prerequisites for substantial performance under the *Construction Act*, RSO 1990, c C.30 have been satisfied.” after the word “*Work*”.
  - Amend paragraph 12.1.1.4 by (a) adding “spare parts, maintenance materials, warranties, data manuals, and specifications” after the words “maintenance documents” and (b) deleting the word “immediate”.
  - Add new paragraphs 12.1.1.9, 12.1.1.10, and 12.1.1.11:
    - “.9      Local fire authority has inspected and confirmed that life safety systems are acceptable, if required by the *Contract Documents*.”
    - “.10      Elevator inspection and approval by governing authority received by Consultant, if required by the *Contract Documents*.”
    - “.11      Any other prerequisites required by the *Contract Documents*.”
  - Amend paragraph 12.1.2 by deleting “to 12.1.1.6” and substituting “, 12.1.1.5, and 12.1.1.8”.
  - Amend paragraph 12.1.4 by deleting “10 calendar days” and substituting “fifteen (15) *Working Days*, or such longer period as may be reasonably required in the circumstances”.
  - Amend paragraph 12.1.6 by adding “RIGHT OF ENTRY AND ” after “GC 12.2 – ”.
- **GC 12.2      RIGHT OF ENTRY AND EARLY OCCUPANCY BY THE OWNER**
  - Delete GC 12.2 EARLY OCCUPANCY BY THE OWNER in its entirety and substitute the following:
    - **GC 12.2 RIGHT OF ENTRY AND EARLY OCCUPANCY BY THE OWNER**
    - “12.2.1 *Owner* shall have the right to enter or occupy the *Work* in whole or in part for the purpose of placing fittings and equipment or for other uses before *Ready-for-Takeover*, if, in the opinion of *Consultant* and *Owner*, such entry or occupation does not prevent or substantially interfere with *Contractor* in completion of the *Contract* within the *Contract Time*. Such entry or occupation shall not be considered as acceptance of the *Work* or in any way relieve *Contractor* from responsibility to complete the *Contract* or its obligations under the *Contract*.”
    - 12.2.2 The use or occupancy of the *Work* or any part thereof by *Owner* shall not be taken in any manner as an acceptance by *Owner* of any work or any other part or parts of the *Work* or *Products* not in accordance with the *Contract Documents* or to relieve *Contractor* or his surety from

liability in respect of the observance or performance of the *Contract* save to the extent that loss or damage is caused during such use or occupancy by *Owner* or by persons for whom *Owner* is responsible. In particular, without limiting the generality of the foregoing, the use or occupancy of the *Work* or any part thereof by *Owner* shall not release *Contractor* from liability, or waive or impair any rights of *Owner*.”

- **GC 12.3      WARRANTY**

- Amend paragraph 12.3.1 by adding the following sentence to the end of the paragraph: “The time period for the warranty with respect to any item corrected shall commence from the date when the defect is corrected and the remedial work is accepted by *Consultant*.”
- Delete from the first line of paragraph 12.3.2 the word, “The” and substitute the words “Subject to paragraphs 1.1.3 and 1.1.4 of GC 1.1 - GENERAL CONDITIONS OF THE STIPULATED PRICE CONTRACT, the”.
- Amend paragraph 12.3.6 by adding the words “, unless otherwise required by the *Contract Documents*” to the end of the third sentence.

- **GC 13.1      INDEMNIFICATION**

- Delete paragraph 13.1.1 in its entirety and substitute the following:
  - “13.1.1 Without restricting the parties obligations to indemnify respecting toxic and hazardous substances, patent fees, and health and safety:
    - .1 *Contractor* shall indemnify and hold harmless *Owner*, *Consultant* and their respective agents and employees from and against claims, demands, losses, costs, damages, actions, suits, or proceedings (hereinafter called “claims”), by third parties that arise out of, or are attributable to, *Contractor’s* performance of the *Work* or anyone for whose acts *Contractor* may be liable including *Subcontractor* and, *Suppliers*; and
    - .2 *Owner* shall indemnify and hold harmless *Contractor*, *Contractor’s* agents and employees from and against claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of *Contractor’s* performance of the *Contract* which are attributable to a lack of or defect in title or an alleged lack of or defect in title to the *Place of the Work*.”
- Delete paragraphs 13.1.2, 13.1.4 and 13.1.5 in their entirety and substitute the following: “Intentionally deleted”.
- Amend paragraph 13.1.3 by deleting “paragraphs 13.1.1 and 13.1.2” and substituting “paragraph 13.1.1”.

- **GC 13.2      WAIVER OF CLAIMS**



- Delete paragraphs 13.2.3, 13.2.4, 13.2.5, and 13.2.7 and substitute the following: “Intentionally deleted”.
- Amend paragraph 13.2.8 by deleting “party” and substituting “*Contractor*”.
- Amend paragraph 13.2.9 by deleting “paragraphs 13.2.1 or 13.2.3” and substituting “paragraph 13.2.1”.

**Add new PART 14 as follows:**

**“PART 14 OTHER PROVISIONS**

• **OWNERSHIP OF MATERIALS**

- Unless otherwise specified, all materials existing at the *Place of the Work* at the time of execution of the *Contract* shall remain the property of *Owner*. All *Work* and *Products* delivered to the *Place of the Work* by *Contractor* shall be the property of *Owner*. *Contractor* shall remove all surplus or rejected materials as its property when notified in writing to do so by *Consultant*.

• **CONSTRUCTION LIENS**

- 14.2.1 *Contractor* shall ensure that *Owner’s* title to the *Project* site is kept free and clear of all construction liens and certificates of action claimed by any person providing services and/or materials to *Contractor* for the *Project*. For greater certainty, this GC 14.2 shall not apply to construction liens or certificates of action that arise as a direct result of the failure by *Owner* to pay *Contractor* in accordance with the terms of this *Contract*.
- 14.2.2 If a construction lien or certificate of action is registered against the title to the *Project* lands, or given with respect to the *Work*, by any person claiming to provide services and/or materials to or through *Contractor*, or *Owner* receives a written notice of lien, *Contractor* shall, within seven (7) *Working Days* of having been notified or becoming aware of the existence of the construction lien, certificate of action or written notice of lien, see to its removal by way of discharge, release or by posting security in accordance with the *Construction Act*, RSO 1990, c C.30, or in the case of a written notice of lien, its written withdrawal
- 14.2.3 In the event that *Contractor* fails to comply with GC 14.2, *Owner* may see to the removal of the construction lien or certificate of action or the withdrawal of the written notice of lien, and in that event, *Contractor* shall be liable to *Owner* for any and all costs and expenses, including legal costs on a full indemnity basis, associated therewith. *Owner* shall be at liberty to set off such costs and expenses against any amount otherwise due to *Contractor* under this *Contract*. If there is no amount owing by *Owner* to *Contractor*, then *Contractor* shall reimburse *Owner* for all of the said costs and associated expenses.

- **CONTRACTOR DISCHARGE OF LIABILITIES**

- 14.3.1 In addition to the obligations assumed by *Contractor* pursuant to GC 3.6 - SUBCONTRACTORS AND SUPPLIERS, *Contractor* agrees to discharge all liabilities incurred by it for labour, materials, services, *Subcontractors* and *Products*, used or reasonably required for use in the performance of the *Work*, except for amounts withheld by reason of legitimate dispute which have been identified to the party or parties, from whom payment has been withheld.

- **DAILY REPORTS/DAILY LOGS**

- 14.4.1 *Contractor* shall cause its supervisor, or such competent person as it may delegate, to prepare a daily log or diary reporting on weather conditions, work force of *Contractor*, *Subcontractors*, *Suppliers* and any other forces on site and also record the general nature of *Project* activities. Such log or diary shall also include any extraordinary or emergency events which may occur and also the identities of any persons who visit the site who are not part of the day-to-day work force.
- *Contractor* shall also maintain records, either at its head office or at the job site, recording manpower and material resourcing on the *Project*, including records which document the activities of *Contractor* in connection with GC 3.4 - CONSTRUCTION SCHEDULE, and comparing that resourcing to the resourcing anticipated when the most recent version of the schedule was prepared pursuant to GC 3.4 - CONSTRUCTION SCHEDULE.

- **HOSPITAL RELATED PROVISIONS**

- 14.5.1 *Contractor* recognizes and understands that *Owner* is a hospital approved under the *Public Hospitals Act*, RSO 1990, c P.40 and is therefore subject to a highly regulated legal and operational environment. Without limiting the generality of any other provision in the *Contract*, *Contractor* shall provide reasonable cooperation and assistance to *Owner* during any evaluations of the *Work* (including, without limitation, any post occupancy evaluation required by the Ministry of Health and Long Term Care) and in obtaining required regulatory approvals prior to using the *Work* (including, without limitation, approvals required by Section 4(2) of the *Public Hospitals Act*, RSO 1990, c P.40).
- 14.5.2 *Contractor* acknowledges that the security and safety of the patients, employees and other occupants of the existing hospital is paramount. If any of the employees of *Contractor* or the *Subcontractors* is determined by *Owner* to be a concern for the security or safety of such patients, employees or occupants, *Owner* may require that *Contractor* replace such employee.
- 14.5.3 *Contractor* recognizes that part of the *Work* may consists of the renovation of existing buildings and structures or the addition of a structure to an existing building and that the provision of patient care

during construction is a priority for *Owner*. *Contractor* shall comply with the reasonable instructions provided by *Owner* (including, without limitation, *Owner's* infection control practitioner) in regard to patient care and the operation and use of the hospital during the performance of the *Work*. Any costs incurred by *Contractor* in complying with the said instructions shall be part of the *Contract Price*.

- 14.5.4 Notwithstanding any other provision in the *Contract*, paramountcy of access must be given to emergency vehicles and no claim may be made by *Contractor* for any delay in the performance of the *Work* as a result of any temporary lack of access to the Place of *Work* resulting from this paramountcy of access by emergency vehicles, provided that *Owner* will use commercially reasonable efforts to avoid and to limit the duration of any temporary lack of access for this reason.
- 14.5.5 *Owner* has the authority, but without the obligation, to stop the *Work* in any circumstance affecting the safety of life or property or otherwise may cause an unsafe condition for the operation of the existing hospital. *Contractor* shall abide by *Owner's* instructions to stop the *Work* and to any related instructions pertaining to the circumstance without any increase in the *Contract Price* and extension in the *Contract Time* if such circumstance was caused by *Contractor*, *Subcontractors* or *Suppliers*.
- 14.5.6 *Contractor* shall, and shall cause the *Subcontractors* and *Suppliers* to, comply with hospital policies and procedures including, without limitation, environmental requirements, infection control measures and safety and emergency preparedness guidelines which are or come into force (including, without limitation, those forming part of the *Contract Documents*) as such documents are amended by *Owner* from time to time, provided that a material amendment to the hospital policies and procedures by *Owner* after the date of the Agreement which gives rise to a significant change in the *Work* shall be dealt with in accordance PART 6 - CHANGES IN THE WORK.”

**PART 1      GENERAL**

**1.1            WORK COVERED BY CONTRACT DOCUMENTS**

- 1.1.1 Work of this Contract comprises renovation of minor interior renovations to correct base building deficiencies, implement code compliance measures, and facilitate relocation of GIM patients from K3E to K2E. Scope includes core layout revisions, K3E modifications to meet OBC and CSA standards or program changes, selective demolition, and patching of existing millwork and walls to remain. Mechanical, Electrical, and Structural work is included as specified in the Contract Documents. Project is identified as HS1024-0383 - SHSC C2 Decant (K3E) and GIM Decant (K2E).
- 1.1.2 Hazardous Materials Present: Hazardous materials are present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is appended to Section 00 31 00 for review and use. Examine report to become aware of locations where hazardous materials are present.

**1.2            PROJECT DELIVERY METHOD**

- 1.2.1 Type of Contract: Project will be constructed under a CCDC2-2020 – Stipulated Price Contract.
- 1.2.2 Specifications in Division 01 form an integral part of each section of Technical Specifications. This includes specifications on Drawings, specifications bound separately, and specifications in structural, civil, mechanical, electrical, and other divisions.
- 1.2.3 The "Work Included" and the "Related Sections" articles in Part 1 of the individual specification sections are intended to serve as a reference for convenience. These articles are meant only as a guide for Contractor and does not remove the responsibility from Contractor to do a complete examination of the specification sections to determine the full extent of the Work.

**1.3            PROJECT COORDINATION AND DIVISION OF WORK**

- 1.3.1 Division of the Work among Trade Contractors, Subcontractors, and Sub-sub-contractors is solely Contractor's responsibility. Consultant and Owner assume no responsibility to act as an arbiter to establish subcontract limits between Sections or Divisions of the Work.
- 1.3.2 Scope and Extent Coordination:
  - 1.3.2.1 Analyze Contract Documents to define the extent of the Work. Coordinate scope and extent of work for each trade. Coordinate work of all trades including construction sequence, schedule and interfacing of all work. Coordinate work of each trade as required for satisfactory and expeditious completion of The Work. Ensure components to be built in are supplied in time with setting Drawings and other related information.
  - 1.3.2.2 Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of

The Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.

- 1.3.2.3 Schedule construction operations in sequence required to obtain the best results, where installation of one part of the Work depends on installation of other components, before or after its own installation. Make adequate provisions to accommodate items scheduled for later installation.

- 1.3.3 Specifications and Drawings Organization: Organization of Specifications into CSI/CSC MasterFormat® Divisions or into 3-part SectionFormat® is solely for Contractor's convenience. This organization is not intended to determine subcontract limits between Sections or Divisions of the Work.

- 1.3.3.1 Arrangement of Specifications, Drawings or schedules, must not affect Contractor's control or responsibility for dividing the Work or establishing each trade's scope of work.

- 1.3.3.2 Claims for additional compensation due to disputes between trades resulting from Contractor's lack of coordination will not be permitted.

#### **1.4 OWNER-SUPPLIED /CONTRACTOR-INSTALLED PRODUCTS**

- 1.4.1 Owner's Responsibilities: Owner will furnish products indicated and perform the following, as applicable:

- 1.4.1.1 Provide to Contractor Owner-reviewed Product Data, Shop Drawings, and Samples.

- 1.4.1.2 Provide for delivery of Owner-furnished products to Project site.

- 1.4.1.3 Upon delivery, inspect, with Contractor present, delivered items.

- .1 If Owner-furnished products are damaged, defective, or missing, arrange for replacement.

- 1.4.1.4 Obtain manufacturer's inspections, service, and warranties.

- 1.4.1.5 Inform Contractor of earliest available delivery date for Owner-furnished products.

- 1.4.2 Contractor's Responsibilities: The Work includes the following, as applicable:

- 1.4.2.1 Designate delivery dates of Owner-furnished products in Contractor's construction schedule, utilizing Owner-furnished earliest available delivery dates.

- 1.4.2.2 Review Owner-reviewed Product Data, Shop Drawings, and Samples, noting discrepancies and other issues in providing for Owner-furnished products in the Work.

- 1.4.2.3 Receive, unload, handle, store, protect, and install Owner-furnished products.

- 1.4.2.4 Make building services connections for Owner-furnished products.

- 1.4.2.5 Protect Owner-furnished products from damage during storage, handling, and installation and prior to Substantial Performance of the Work.

1.4.2.6 Repair or replace Owner-furnished products damaged following receipt.

1.4.3 Owner-Furnished/Contractor-Installed (O/C) Products:

1.4.3.1 Refer to Equipment Schedule and Drawings for items identified as "O/C".

## **1.5 WORK BY OTHERS OR BY OWNER'S FORCES**

1.5.1 Cooperate fully with Owner, so work may be carried out smoothly, without interfering with or delaying Work under this Contract or work by Owner. Coordinate the Work of this Contract with work performed by Owner.

1.5.2 Co-ordinate work with other contractors. If any part of work under this Contract depends for its proper execution or result upon work of another contractor, report promptly to Consultant, in writing, any defects which may interfere with proper execution of Work.

1.5.3 NIC Work: "NIC" refers to Work not performed or provided under this Contract. "NIC" signifies "Not In this Contract" or "Not a Part of Work by Contractor". NIC Work may be shown on Drawings and in scheduling amount of time and materials necessary for completion of Contract.

## **1.6 CONTRACTOR USE OF PREMISES**

1.6.1 Restricted Use of Site: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.

1.6.2 Limits on Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated. Limit use of premises to allow:

1.6.2.1 Owner occupancy.

1.6.2.2 Partial owner occupancy.

1.6.2.3 Work by other contractors.

1.6.2.4 Public usage.

1.6.3 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.

1.6.4 Refer to Section 01 14 00 -Work Restriction for additional requirements.

## **1.7 OWNER OCCUPANCY**

1.7.1 Owner will occupy construction grounds for execution of normal operations during construction period.

1.7.2 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Owner to facilitate work as stated.

1.7.3 Co-operate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.

1.7.4 Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or

used facilities without written permission from Owner and approval of authorities having jurisdiction.

- 1.7.5 Where security has been reduced by Work of Contract, provide temporary means to maintain security.
- 1.7.6 Notify Owner not less than 5 days in advance of activities that will affect Owner's operations.

## **1.8 EXISTING SERVICES**

- 1.8.1 Notify Owner and utility companies of intended interruption of services and obtain required permission.
- 1.8.2 Establish location and extent of service lines in area of work before starting Work. Notify Consultant of findings.
- 1.8.3 Submit schedule for approval by Owner for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.
- 1.8.4 Where unknown services are encountered, immediately advise Consultant and confirm findings in writing.
- 1.8.5 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.
- 1.8.6 Record locations of maintained, re-routed and abandoned service lines.
- 1.8.7 Construct barriers, as required, in accordance with Section 01 51 00.

## **1.9 ACCESS AND EGRESS**

- 1.9.1 Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, ramps or ladders and scaffolding, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

## **1.10 WORK RESTRICTIONS**

- 1.10.1 Comply with restrictions on construction operations. Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.
- 1.10.2 Refer to Section 01 14 00 -Work Restriction for additional requirements.

## **1.11 SPECIFICATION AND DRAWING CONVENTIONS**

- 1.11.1 Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
  - 1.11.1.1 Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
  - 1.11.1.2 Text Color: Text used in the Specifications, including units of measure, manufacturer and product names, and other text may appear in

multiple colours or underlined as part of a hyperlink; no emphasis is implied by text with these characteristics.

- 1.11.1.3 Hypertext: Text used in the Specifications may contain hyperlinks. Hyperlinks may allow for access to linked information that is not residing in the Specifications. Unless otherwise indicated, linked information is not part of the Contract Documents.
- 1.11.1.4 Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- 1.11.1.5 Division 00 Contracting Requirements: General provisions of the Contract, including General and Supplementary Conditions, apply to all Sections of the Specifications.
- 1.11.1.6 Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- 1.11.2 Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
  - 1.11.2.1 Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
  - 1.11.2.2 Abbreviations: Materials and products are identified by abbreviations scheduled on Drawings.
  - 1.11.2.3 Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

## **1.12 SUSTAINABILITY TARGETS**

- 1.12.1 Project does not intend to target specific sustainability certifications. Contractor is nonetheless encouraged to employ best-practice sustainable measures throughout duration of construction to minimize CO2 emissions, enhance indoor air quality, and optimize resource use to reduce project's environmental footprint.

## **1.13 CONTRACT DOCUMENTS FOR CONSTRUCTION PURPOSES**

- 1.13.1 Electronic Documents: Owner will supply Contractor with complete set of Contract Documents in PDF format prior to commencement of The Work. Contractor is permitted to print hard copies for construction purposes.
- 1.13.2 Hard Copies: Owner will provide Contractor with one (1) hard copy set of Contract Documents for construction purposes. Additional sets are at Contractor's expense for costs incurred due to printing, handling, and shipping.
- 1.13.3 "IFC" Documents: Contractor acknowledges that Drawings and Specifications labeled as "Issued for Construction" or "IFC" represent Consultant's best effort at incorporating revisions issued during addenda and bidding or negotiation phase. In case of discrepancies, omission or conflict between "Issued for Construction" documents and Contract Documents, Contractor must promptly notify Consultant.



**1.14 ORIGINAL DATA FILES**

- 1.14.1 Files Provided Consultant: Consultant will provide data files in their original format for Contractor's use during construction process and for preparation of as-built or record drawings. Data Accuracy Disclaimer: Consultant makes no representations as to accuracy or completeness of files as they relate to Contract Drawings.
  - 1.14.1.1 Copy of Contract Documents for the purpose of creating As-Built Drawings and other documentation may not include changes issued as Addenda, Supplementary Instructions, or Change Orders.
- 1.14.2 Format: Consultant will provide the Contractor with complete set of data files and as available from respective Subconsultants after receiving signed waiver by the Contractor.
- 1.14.3 Licensing Agreements for Use of Digital Files:
  - 1.14.3.1 Contractor's Data Licensing Agreement: Contractor must execute a data licensing agreement in a form acceptable to both the Owner and Consultant. A copy of Consultant's typical agreement is provided in Appendix A
  - 1.14.3.2 Subcontractors and Third Parties' Agreement: Subcontractors and other parties granted access by Contractor to Consultant's original data files must also execute a data licensing agreement in a form acceptable to both the Owner and Consultant.

**1.15 DOCUMENTS REQUIRED ON SITE**

- 1.15.1 Keep the following documents at Place of the Work, stored securely and in good order and available to Owner and Consultant in hard copy and digital form:
  - 1.15.1.1 Contract Drawings.
  - 1.15.1.2 Specifications.
  - 1.15.1.3 Addenda.
  - 1.15.1.4 Reviewed Shop Drawings.
  - 1.15.1.5 List of Outstanding Shop Drawings.
  - 1.15.1.6 Change Orders.
  - 1.15.1.7 Other Modifications to Contract.
  - 1.15.1.8 Infection Prevention and Control documents
  - 1.15.1.9 Other documents as specified.

**1.16 DISCREPANCIES/CONFLICTS/OMISSIONS**

- 1.16.1 If discrepancies, conflicts, or omissions in Drawings, Specifications, or other Contract Documents are suspected or if there is uncertainty about their meaning or intent, such uncertainties must immediately be reported to Consultant.
- 1.16.2 Resolving Conflicting Specifications: In cases where Specifications require compliance with multiple requirements that establish different or conflicting quantities or quality levels, Contractor must adhere to most stringent requirement. Where requirements are stated differently, but have apparently

equal effects, immediately notify Consultant and obtain instructions before proceeding.

- 1.16.3 Resolving Conflicting Reference Standards: If compliance with multiple reference standards is specified and such standards establish different or conflicting requirements for minimum quantities or quality levels, comply with most stringent requirement. Where requirements are stated differently, but have apparently equal effects, immediately notify Consultant and obtain instructions before proceeding.
- 1.16.4 Minimum Quantity or Quality Levels: Specified or illustrated quantities or quality levels represent minimum that must be provided or performed. Actual installation may meet minimum specified levels or exceed them within reasonable limits. Numeric values indicated are to be interpreted as minimum or maximum as appropriate. Uncertainties must be referred to the Consultant for clarification.
- 1.16.5 Comply with Consultant's written instructions or explanations and proceed accordingly. If Changes to the Work are suspected or required, refer to Section 01 26 00, for appropriate procedures to follow.

**END OF SECTION**

**1.1 WORK RESTRICTIONS**

- 1.1.1 Comply with the requirements outlined in Sunnybrook Health Sciences Centre (SHSC) policies, procedures, and forms appended to Section 00 31 00 hereinafter referred to as the "Owner Construction Procedures".
- 1.1.2 Construction Activities and Boundaries: Confine construction activities and materials to area indicated on Drawings and within property lines. Where temporary extension of boundaries is required by Contractor to perform work of this Contract, obtain permission from Owner, and perform such work at no additional cost to Owner.
  - 1.1.2.1 Additional Storage or Work Areas: Owner will not provide storage space outside the designated construction site. Make their own arrangements and be responsible for any costs associated with offsite storage or additional work areas needed for operations under Contract
- 1.1.3 Work Hours:
  - 1.1.3.1 Regular Work Hours: Defined Monday to Friday, 6:00 AM to 6:00 PM, excluding statutory holidays, unless noted otherwise or directed by the Owner's Project Manager.
  - 1.1.3.2 After-Hours Work: Defined as work outside of Regular Work Hours, including evenings, nights, weekends, and statutory holidays. Specific areas may have different definitions or restrictions; Contractor to verify with Owner's Project Manager prior to scheduling work.
  - 1.1.3.3 After-Hours Work Notification: For any work planned during After-Hours, Contractor must notify Owner's Project Manager via email at least 3 days in advance. Email must include: Project Name, Owner's Project Manager, Contractor's Name and Site Contact, Site Location, detailed Description of Work, and the exact date(s) and time(s) of the proposed work.
  - 1.1.3.4 Premium Time: Include in the Contract Price all costs associated with performing work during required after-hours or specific time windows (including disruptive work, shutdowns, deliveries), maintaining hospital services and life safety systems, coordination, security, cleaning, and meeting construction schedules and in accordance with Owner's Construction Procedures.
    - .1 Additional hoarding or containment modifications may be required for work performed after-hours. Refer to Section 01 35 33 and Owner's Construction Procedures.
    - .2 Claims for additional costs arising from failure to account for these requirements will not be considered.
- 1.1.4 Facility to remain operational: Facility will remain fully operational 24 hours a day, 7 days a week during the course of The Work. The Owner will occupy portions of the premises adjacent to and within the construction zone throughout the construction period. Cooperate fully with the Owner's Project Manager and building operations staff to schedule the Work in a manner that minimizes

disruptions to all hospital activities and ensures the safety and comfort of patients, staff, visitors, and volunteers.

- 1.1.4.1 Assume responsibility for care, custody, and control of portion of existing building made available to Contractor and Make Good damage attributable to construction activities. Restore to condition existing before construction activities began.
- 1.1.4.2 Use premises for construction activities, storage, and access while accommodating Owner occupancy (whether complete or partial), Work by other contractors, and public usage.
- 1.1.4.3 Coordinate use of premises under direction of Owner.
- 1.1.5 Perform construction activities in a manner that prioritizes safety and comfort of building occupants. Implement measures to maintain building access, utility continuity, and to suppress dust and noise.
- 1.1.6 Disruptive Operations: Coordinate operations that cause significant noise, vibration, dust, or odours with Owner. Secure prior written permission for such activities.
  - 1.1.6.1 Submit a minimum two (2) week look-ahead schedule for all upcoming work, specifically identifying potential disruptive activities, to the Owner on a weekly basis.
  - 1.1.6.2 Disruptive work generally must be performed during after-hours or at other specific times agreed upon in advance with Owner. Obtain prior approval via Activity Permit and look-ahead schedule process.
  - 1.1.6.3 Owner reserves the right to order a cease work directive if construction activities cause undue disruption or complaints from patients, staff, or visitors. Contractor shall immediately comply and propose alternative methods or scheduling acceptable to Owner.
  - 1.1.6.4 Pneumatic or other noisy equipment is not permitted on the project site.
- 1.1.7 Utility Interruptions and Shutdowns: The Contractor shall comply with the Owner's notification and approval processes for planned utility shutdowns and obtain necessary written permissions. All interruptions require a minimum of 14 working days advance notice and 25 working days advance notice for major utility interruptions and shutdowns. The Owner reserves the right to request that interruptions are planned outside of normal business hours or at a specific time and date.
- 1.1.8 Life Safety Requirements:
  - 1.1.8.1 Comply with applicable requirements of Fire Code in force at Place of the Work and Owner's Fire Watch Procedure.
  - 1.1.8.2 Access and Egress for Occupants: Provide and maintain safe, clearly marked, and unobstructed access and egress routes for construction staff *and* building occupants at all times. Comply with approved Separation Plan as defined by Owner's Construction Procedures.
- 1.1.9 Fire Protection System Integrity: Maintain fire alarm zones, sprinkler zones, and detection devices fully operational unless an approved bypass or impairment (Red Tag) is in effect, in accordance with Fire Watch Procedure. Obtain required

Fire Alarm Bypasses before undertaking work that could affect systems (dust, vibration, physical contact). Do not cover, bag, or otherwise obstruct smoke/heat detectors unless specifically permitted and documented as part of an approved fire alarm bypass.

1.1.9.1 Determine nature and exact locations of existing fire and smoke sensors prior to the commencement of the Work. Perform Work carefully to avoid triggering sensors.

1.1.9.2 Costs incurred on account of false fire alarms activated as a result of construction operations without adequate precautions (including required bypasses) are Contractor's responsibility and may be back-charged to Contractor.

1.1.10 Fire Routes: Maintain designated fire access routes, including overhead clearances, clear and accessible for use by emergency response vehicles at all times.

1.1.11 Site Access, Egress, Deliveries, and Parking:

1.1.11.1 Driveways, Walkways, and Entrances: Keep hospital driveways, walkways, and entrances serving Owner operations clear and unobstructed for Owner, patient/visitor, and emergency vehicle use. Schedule deliveries to minimize disruptions and adhere to loading dock procedures as detailed in Owner's Construction Procedures.

1.1.11.2 Loading Dock and Elevator Use: comply with Owner's Construction Procedures regarding use of loading docks and elevators. Material deliveries, removals, and transport using elevators are generally restricted to after-hours unless otherwise approved by Owner. Specific elevators will be designated for construction use. Refer to Section 01 51 00 for additional requirements.

1.1.11.3 Booking of elevators and loading dock access is mandatory and requires advance notice through the specified channels in Owner's Construction Procedures.

1.1.11.4 Comply with safe work practices at loading docks (designated areas, dock plates, engine shutoff, signalers, walkways). Loading dock must be used for active loading/unloading only and not for staging or storage.

1.1.11.5 Parking: Contractor personnel parking will not be permitted at Owner's facility. Arrange for off-site parking.

1.1.12 Work on Public or Municipal Property: comply with regulations of municipality and authorities having jurisdiction including associated fees, permits, insurance or bonding required.

1.1.13 Prohibition on Smoking, Vaping, and Controlled Substances: Smoking or vaping of any type (tobacco, e-cigarettes, cannabis, etc.) is strictly prohibited anywhere on Owner's property, including within a 9-metre radius external to any facility entrance or exit, and in all outdoor courtyards or open or rooftop mechanical spaces. A strict no-alcohol and no-controlled substances policy is also enforced. Non-compliance will result in immediate removal from site.

- 1.1.14 Restriction of Site Access to Non-Construction Personnel: Limit site access strictly to authorized individuals, except for visitors authorized by Contractor.
  - 1.1.14.1 All individuals employed or sub-contracted by the Contractor must complete the Owner's Contractor orientation and review all applicable policies prior to commencing work on site, as confirmed by the signed Sunnybrook Contractor Safety Form
  - 1.1.14.2 All Contractor personnel must be properly identified and obtain and wear an Owner-issued picture ID badge at all times. Badges must be returned to the Owner upon project completion or termination of the individual's work on site.

## **1.2 WORK PHASES**

- 1.2.1 Phased Construction Schedule: The Contractor shall schedule and construct the Work in phases to allow for the Owner's and occupants' continued or intermittent use of the premises during construction. Portions of facilities shall not be closed until alternate usage is made available via completed Work phases.
  - 1.2.1.1 The Contractor shall maintain operational life safety systems and public access to exits in occupied areas during all phases of the Work.
  - 1.2.1.2 Refer to phasing diagrams on the Drawings for required phases of Work.
- 1.2.2 Before starting Work on each phase, the Contractor shall submit an updated copy of the Construction Schedule. The schedule shall indicate the sequence, commencement, and completion dates, and, if applicable, move-out and move-in dates for the Owner's personnel for all phases of Work. Provide minimum of 14 working days notice to Owner before switching from one phase to the next to allow Owner to prepare space for Contractor use.
- 1.2.3 Allow minimum of 20 working days (4 business weeks) between completion of phase 1 (K2E) and commencement of phase 2 (K3E) to permit Owner move-in operations. During move-in period, no work shall occur at the Place of the Work.
- 1.2.4 The Contractor shall cooperate and coordinate with the Consultant for moving the Owner's equipment into the building when a phase of the Work is ready for its intended use.

END OF SECTION

**PART 1      GENERAL**

**1.1            CASH ALLOWANCES**

- 1.1.1 Conform to CCDC 2-2020, GC. 4.1 as modified by any Supplementary Conditions.
- 1.1.2 Disbursements from Cash Allowances are intended for Work not shown or described in the Bid Documents and shall be authorized by Consultant in writing, as applicable.
- 1.1.3 Owner, through Consultant, will determine by whom and for what amount each cash allowance item will be performed. Obtain Owner's prior written approval in the form of a Change Order before entering into a subcontract, amending an existing subcontract, or performing own forces work included in a cash allowance. Upon issuance of the Change Order, Contractor's responsibilities for a cash allowance item shall be the same as for other work of the Contract.
- 1.1.4 Include specified cash allowances in Contract Price.
- 1.1.5 Cash allowances, unless otherwise specified, cover net cost to Contractor of services, products, construction machinery and equipment, freight, handling, unloading, storage, installation and other authorized expenses incurred in performing Work.
- 1.1.6 Where costs under a cash allowance exceed the amount of the allowance, unexpended amounts from other cash allowances shall be reallocated at the Consultant's direction to cover the shortfall
- 1.1.7 Contract Price, and not cash allowance, includes Contractor's overhead and profit in connection with such cash allowance.
- 1.1.8 Disbursements from Cash Allowances shall be authorized by Consultant in writing and by Change Order.
- 1.1.9 Contract Price will be adjusted by written order to provide for excess or deficit to each cash allowance.
- 1.1.10 Extend to Owner refunds, trade and quantity discounts which may be received in purchasing under Cash Allowances, except cash discounts for prompt payment.
- 1.1.11 Include progress payments on accounts of work authorized under cash allowances in Consultant's monthly certificate for payment.
- 1.1.12 Prepare schedule jointly with Consultant and Contractor to show when items called for under cash allowances must be authorized by Consultant for ordering purposes so that progress of Work will not be delayed.
- 1.1.13 At Consultant's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- 1.1.14 Purchase products and systems selected by Consultant from the designated supplier.

- 1.1.15 Submit invoices, summary statements or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- 1.1.16 Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.
- 1.1.17 Coordinate and process submittals for allowance items in same manner as for other portions of the Work.
- 1.1.18 Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
  - 1.1.18.1 If requested by Consultant, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.
- 1.1.19 Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.
- 1.1.20 Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

## **1.2 CASH ALLOWANCES FOR SUPPLY AND INSTALLATION OF PRODUCTS**

- 1.2.1 Amount of each cash allowance includes:
  - 1.2.1.1 All costs to provide the specified Products, including supply, installation, and related costs, excluding Value Added Taxes.
- 1.2.2 Amount of each cash allowance does not include Contractor's, Subcontractor's or sub-Subcontractor's overhead and profit, and other related costs, which shall be included in the Contract Price and not in the cash allowance.

## **1.3 CASH ALLOWANCES FOR SERVICES**

- 1.3.1 Amount of each cash allowance includes:
  - 1.3.1.1 All costs related to the services, excluding Value Added Taxes.
  - 1.3.1.2 Subcontractor's and sub-Subcontractor's overheads and profits related to the cash allowance.
- 1.3.2 Amount of each cash allowance does not include Contractor's overhead and profit, and other related costs, which shall be included in the Contract Price and not in the cash allowance.



**1.4 LIST OF CASH ALLOWANCES**

1.4.1 Provide cash allowances as follows:

<b>No.</b>	<b>Cash Allowance Description</b>	<b>Amount</b>
1	For supply and installation of Unforeseeable Building Conditions, Roof Modifications, Asbestos Abatement, and Re-insulating piping.	\$170,000.00
2	For inspection and testing by independent inspection and testing agency.	\$15,000.00
	<b>TOTAL OF CASH ALLOWANCES</b>	<b>\$185,000.00</b>

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.1 DEFINITIONS**

- 1.1.1 In this Section "Substitution" means a Product, a manufacturer, or both, not originally specified in Contract Documents by proprietary name but proposed for use by Contractor in place of a Product, a manufacturer, or both, specified by proprietary name.
- 1.1.2 Substitutions for Cause: this refers to changes proposed by Contractor to accommodate altered Project conditions, such as the absence of a particular product, changes in regulations, trade restrictions, tariff impacts, or the inability to provide the specified warranties.
- 1.1.3 Substitutions for Convenience: this refers to changes proposed by either Contractor or Owner, which are not necessary to fulfill other Project requirements but could provide benefits to either party.

### **1.2 SUBSTITUTION PROCEDURES**

- 1.2.1 Unless specified otherwise, use materials and manufacturers indicated in the Contract Documents.
- 1.2.2 Unless specified otherwise, Substitution requests during the Bidding period are not permitted.
- 1.2.3 Unless specified otherwise, Substitutions for Convenience are not permitted.
- 1.2.4 Provided a proposed Substitution for Cause submission includes all of the information specified in this Section under Submission Requirements For Proposed Substitutions, Consultant will promptly review and accept or reject the proposed Substitution.
- 1.2.5 Consultant may accept a Substitution for Cause if satisfied that:
  - 1.2.5.1 the proposed substitute Product is the same type as, is capable of performing the same functions as, interfaces with adjacent work the same as, and meets or exceeds the standard of quality, performance and, if applicable, appearance and maintenance considerations, of the specified Product,
  - 1.2.5.2 the proposed substitute manufacturer has capabilities comparable to the specified manufacturer, and the Substitution provides a benefit to Owner.
- 1.2.6 If Contractor fails to order a specified Product or order a Product by a specified manufacturer in adequate time to meet Contractor's construction schedule, Consultant will not consider that a valid reason to accept a Substitution.
- 1.2.7 If Consultant accepts a Substitution and subject to Owner's agreement, the change in the Work will be documented in the form of either a Supplemental Instruction or Change Order as specified in Section 01 26 00 – Contract Modification Procedures.

- 1.2.8 If a Substitution is accepted in the form of a Supplemental Instruction or Change Order, Contractor shall not revert to an originally specified Product or manufacturer without Consultant's prior written acceptance.

### **1.3 SUBMISSION REQUIREMENTS FOR PROPOSED SUBSTITUTIONS**

- 1.3.1 Make all Substitution requests using the form appended to this Section.
- 1.3.2 Include with each proposed Substitution the following information, as applicable:
- 1.3.2.1 Identification of the Substitution, including product name and manufacturer's name, address, telephone numbers, and web site.
  - 1.3.2.2 Reason(s) for proposing the Substitution.
  - 1.3.2.3 A statement verifying that the Substitution will not affect the Contract Price and Contract Time or, if applicable, the amount and extent of a proposed increase or decrease in Contract Price and Contract Time on account of the Substitution.
  - 1.3.2.4 A statement verifying that the Substitution will not affect the performance or warranty of other parts of the Work.
  - 1.3.2.5 Manufacturer's Product literature for the Substitution, including material descriptions, compliance with applicable codes and reference standards, performance and test data, compatibility with contiguous materials and systems, and environmental considerations.
  - 1.3.2.6 Product samples as applicable.
  - 1.3.2.7 A summarized comparison of the physical properties and performance characteristics of the specified Product and the Substitution, with any significant variations clearly highlighted.
  - 1.3.2.8 Availability of maintenance services and sources of replacement materials and parts for the Substitution, as applicable, including associated costs and time frames.
  - 1.3.2.9 If applicable, estimated life cycle cost savings resulting from the Substitution.
  - 1.3.2.10 Details of other projects and applications where the Substitution has been used.
  - 1.3.2.11 Identification of any consequential changes in the Work to accommodate the Substitution and any consequential effects on the performance of the Work as a whole. A later claim for an increase to the Contract Price or Contract Time for other changes in the Work attributable to the Substitution will not be considered.

END OF SECTION

**1.1 PROJECT INFORMATION**

Project: \_\_\_\_\_  
From: \_\_\_\_\_  
Date: \_\_\_\_\_

**1.2 PROPOSED SUBSTITUTION**

**REFERENCE INFORMATION**

Specification Section  
Number and Title: \_\_\_\_\_

Drawing Reference  
(if applicable): \_\_\_\_\_

Page: \_\_\_\_\_ Article/Paragraph: \_\_\_\_\_

Specified  
Product: \_\_\_\_\_

**SUBSTITUTION INFORMATION**

Proposed Substitution  
(Product Name): \_\_\_\_\_

Product Description: \_\_\_\_\_  
\_\_\_\_\_

Product  
History: ☐ New Product ☐ 2-5 years old ☐ 5-10 years old ☐ > 10 years old

Manufacturer: \_\_\_\_\_

Standard Warranty Offered: \_\_\_\_\_

Extended Warranty Available? ☐ Yes ☐ No

Address: \_\_\_\_\_  
\_\_\_\_\_

Name of Technical  
Representative (TR): \_\_\_\_\_

Technical Representative's Contact

Phone \_\_\_\_\_

Email: \_\_\_\_\_

Trade Name:

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**Tariff Impact Disclosure**

Has a tariff significantly increased the cost of the specified product? ☐ Yes ☐ No

If yes, attach cost comparison showing pre- and post-tariff pricing.

**Canadian Consideration**

Is the proposed product manufactured in Canada? ☐ Yes ☐ No .

If no, explain why a Canadian product cannot be provided:

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Differences between proposed substitution and specified product:

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Reason for not providing specified item:

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Will proposed substitution affect other parts of Work? ☐ No ☐ Yes; explain\_\_\_\_\_

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### REFERENCE INSTALLATIONS

*List below installations that reference the product installed in projects that are similar in scope and size.  
Provide at least 3 pertinent reference installations*

#### PROJECT NO.1

Project Title: \_\_\_\_\_

Project Description: ☐ Commercial ☐ Residential ☐ Retail ☐ Healthcare ☐ Other: \_\_\_\_\_

Date Installed: \_\_\_\_\_ Location: \_\_\_\_\_

Reference Contact (if known): Phone: \_\_\_\_\_ Email: \_\_\_\_\_

#### PROJECT NO.2

Project Title: \_\_\_\_\_

Project Description: ☐ Commercial ☐ Residential ☐ Retail ☐ Healthcare ☐ Other: \_\_\_\_\_

Date Installed: \_\_\_\_\_ Location: \_\_\_\_\_

Reference Contact (if known): Phone: \_\_\_\_\_ Email: \_\_\_\_\_

#### PROJECT NO.3

Project Title: \_\_\_\_\_

Project Description: ☐ Commercial ☐ Residential ☐ Retail ☐ Healthcare ☐ Other: \_\_\_\_\_

Date Installed: \_\_\_\_\_ Location: \_\_\_\_\_

Reference Contact (if known): Phone: \_\_\_\_\_ Email: \_\_\_\_\_

**SUSTAINABLE INFORMATION**

*Indicate below sustainable information that apply to this Product.*

**MANUFACTURING LOCATION**

What is the location of the manufacturing plant for this particular product?

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**ENVIRONMENTAL PRODUCT DECLARATION (EPD)**

Does the product have a compliant environmental product declaration (EPD)? ☐ Yes ☐ No

EPD Type: ☐ Industry Wide EPD ☐ Product Specific EPD

Indicate EPD expiry date: \_\_\_\_\_

**MATERIALS AND RESOURCES**

Does the product contain wood Products? ☐ Yes ☐ No

If yes, Indicate percentage of FSC Certified wood in product: \_\_\_\_\_

Indicate wood product low-emitting characteristics:

☐ No Added Urea Formaldehyde (NAUF) ☐ Ultra-low Emitting Formaldehyde (ULEF)

Does the product contain post-consumer or pre-consumer recycled content? ☐ Yes ☐ No

If yes, Indicate percentage of pre-consumer recycled content: \_\_\_\_\_

If yes, Indicate percentage of post-consumer recycled content: \_\_\_\_\_

**DISCLOSURE AND TRANSPARENCY**

Does the product participate in extended producer responsibility program? ☐ Yes ☐ No

Does the product have a "Declare" label with ingredient disclosure greater than 1000 ppm? ☐ Yes ☐ No

Does the product have a Fully Declare Health Product Declaration? ☐ Yes ☐ No

Is this product CDPH Emissions testing compliant? ☐ Yes ☐ No

Indicate product VOC content (g/l): \_\_\_\_\_



**SUPPORTING DATA**

*Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.*

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation

Supporting Data Attached: ☐ Drawings ☐ Product Data ☐ Samples ☐ Test Reports

**FOR INTERNAL USE ONLY**

- ☐ Substitution approved - Make submittals in accordance with Section 01 25 00.
- ☐ Substitution approved as noted - Make submittals in accordance with Section 01 25 00.
- ☐ Substitution rejected - Use specified materials.

**1.3 DECLARATIONS**

- .1 I/We the undersigned agree that the Owner reserves the right to accept or reject any or all of the proposed substitution/alternatives and may request that materials specified in the Bidding and Contracting Documents be used.
- .2 I/We the undersigned understand that by submitting this Substitution Request, I/We assume full responsibility for ensuring that all requirements are considered.
- .3 I/We hereby certify that:
  - .1 Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
  - .2 Same warranty will be supplied for proposed substitution as for specified product.
  - .3 Same maintenance service and source of replacement parts, as applicable, is available.
  - .4 Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
  - .5 Proposed substitution does not affect dimensions and functional clearances.
  - .6 Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

SUBMITTED BY:

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Signature of  
Duly Authorized  
Signing Officer

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Affix Seal Here

Position:

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Firm:

---

Street Address:

---

City, Province, Postal Code

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Phone:

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Respectfully submitted this

\_\_\_\_ day of \_\_\_\_\_, 20\_\_ at \_\_\_\_\_.

**END OF SECTION**

**ISSUED DATE:** 2025-11-20  
**ISSUED FOR:** TENDER

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**PART 1        GENERAL**

**1.1            VALUATION OF CHANGES BASED ON AGREED UNIT PRICES**

- 1.1.1 The Consultant may, at the outset of the Contract or at any other time, request the Contractor to submit unit prices anticipated to be required in valuing changes in the Work.
- 1.1.2 The Contractor shall submit such unit prices promptly upon request.
- 1.1.3 The unit prices shall be valid for a specified duration.
- 1.1.4 The unit prices shall exclude all fees for overhead and profit and shall be subject to the percentage fees specified in the Owner's Supplementary Conditions. .
- 1.1.5 The Consultant will evaluate the Contractor's quoted unit prices and, if accepted by the Owner in writing, the agreed unit prices shall be used to value subsequent proposed changes in the Work wherever they are applicable.

**1.2            METHOD OF CONTRACT PRICE ADJUSTMENT - CHANGE ORDERS**

- 1.2.1 Unless otherwise agreed, the adjustment of the Contract Price on account of a proposed change in the Work shall be based on a quotation for a fixed price increase or decrease to the Contract Price regardless of the Contractor's actual expenditures and savings.
- 1.2.2 If unit prices included in the stipulated price contract are applicable to the proposed change, the adjustment of the Contract Price shall be based on those unit prices, to the extent they apply.
- 1.2.3 Unless otherwise agreed, the adjustment of Unit Prices affected by a proposed change in the Work shall be based on a quotation for an increase or decrease to existing Unit Prices, or new Unit Prices, as applicable, regardless of the Contractor's actual expenditures and savings.
- 1.2.4 If necessary and unless otherwise agreed, the adjustment of the GMP or the Target Contract Price on account of a proposed change in the Work shall be based on a quotation for an increase or decrease to the GMP or Target Contract Price. The increase or decrease shall include an adjustment to the Contractor's fixed fee, if any, as agreed by the Owner and the Contractor.

**1.3            CHANGE ORDER PROCEDURES**

- 1.3.1 Upon issuance by the Consultant to the Contractor of a proposed change in the Work, and unless otherwise requested in the proposed change or unless otherwise agreed:
  - 1.3.1.1 Submit to the Consultant a fixed price quotation for the proposed change in the Work within 10 days after receipt of the proposed change in the Work.
  - 1.3.1.2 If requested in the proposed change, provide a detailed breakdown of the price quotation including the following to the extent applicable, with appropriate supporting documentation:

**ISSUED DATE:** 2025-11-20  
**ISSUED FOR:** TENDER

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- .1 Estimated labour costs, including hours and applicable hourly rates based on the accepted schedule of labour rates.
  - .2 Estimated Product costs, including Supplier quotations, estimated quantities and unit prices.
  - .3 Estimated Construction Equipment costs.
  - .4 Enumeration of all other estimated costs included in the price quotation.
  - .5 Estimated credit amounts for labour and Products not required on account of the proposed change.
  - .6 Fees, not exceeding the applicable percentages for overhead and profit as specified in this Section.
  - .7 Where applicable, Subcontractor quotations, also including a detailed breakdown of all of the above.
- 1.3.1.3 Include in the quotation the increase or decrease to the Contract Time, if any, for the proposed change, stated in number of days.
  - 1.3.1.4 Include in the quotation the number of days for which the quotation is valid.
  - 1.3.1.5 The quotation will be evaluated by the Consultant and the Owner and, if accepted by the Owner, be documented in the form of a signed Change Order.

#### **1.4 FEES FOR OVERHEAD AND PROFIT – CHANGE ORDERS**

- 1.4.1 Where the Contractor's price quotation for a Change Order results in a net increase to the Contract Price, the Contractor's entitlement to a fee for overhead and profit in the quotation shall be as noted in the Supplementary Conditions.
- 1.4.2 Where the Contractor's or a Subcontractor's price quotation for a Change Order results in a net decrease in price before adjustment for fees for overhead and profit, such a price quotation shall be for the net decrease without any adjustment for fees for overhead and profit.

#### **1.5 METHOD OF CONTRACT PRICE ADJUSTMENT - CHANGE DIRECTIVES**

- 1.5.1 Unless the Owner and the Contractor reach an earlier agreement on the adjustment to the Contract Price by means of a Change Order that cancels the Change Directive, the adjustment in the Contract Price for change carried out by way of a Change Directive shall be determined as specified in the General Conditions of Contract after the change in the Work is completed.

#### **1.6 CHANGE DIRECTIVE PROCEDURES**

- 1.6.1 If a Change Directive is issued for a change in the Work for which a proposed change was previously issued, but no Change Order has yet been signed, the Change Directive shall cancel the proposed change and any Contractor quotations related to that change in the Work.

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- 1.6.2 When proceeding with a change in the Work under a Change Directive, keep accurate records of daily time sheets for labour and Construction Equipment, and invoices for Product and Construction Equipment costs. Submit such records to the Consultant weekly, until the Change Order superseding the Change Directive is issued.

## **1.7 FEES FOR OVERHEAD AND PROFIT – CHANGE DIRECTIVES**

- 1.7.1 The Contractor's entitlement to a fee for overhead and profit on the Contractor's expenditures and savings attributable to a Change Directive shall be as noted in the Supplementary Conditions.
- 1.7.2 Where a Change Directive results in net savings on account of work not required to be performed and a net decrease in the Contractor's or Subcontractor's cost, the net savings to the Contractor or Subcontractor shall be calculated without any adjustment for fees for overhead and profit.
- 1.7.3 When a Change Directive is ultimately recorded as a Change Order, there shall be no additional entitlement to fees for overhead and profit beyond those specified in this article.

## **1.8 SUPPLEMENTAL INSTRUCTIONS**

- 1.8.1 The Consultant may issue Supplemental Instructions to provide clarifications to the Contract Documents, provide additional information, or make minor variations in the Work not involving adjustment in the Contract Price or Contract Time.
- 1.8.2 If the Contractor considers a Supplemental Instruction to require an adjustment in Contract Price or Contract Time, the Contractor shall promptly notify the Consultant and the Owner in writing and shall not proceed with any work related to the Supplemental Instruction pending receipt of a Change Order, a Change Directive, or, in accordance with the dispute resolution provisions of the General Conditions of Contract, a Notice in Writing of a dispute and instructions to proceed.

**END OF SECTION**

## **1.1 SUMMARY**

- 1.1.1 This Section specifies the administrative and procedural requirements for managing and processing Requests for Information (RFIs) related to the Contract Documents.
- 1.1.2 The RFI process is a cooperative effort between the Contractor and the Consultant to facilitate communication and maintain project progress.
- 1.1.3 Use of project collaboration systems or alternative RFI processing methods shall be subject to review and acceptance by the Consultant.
- 1.1.4 The RFI process is intended to:
  - 1.1.4.1 Obtain interpretations or clarifications of the Contract Documents from the Consultant.
  - 1.1.4.2 Obtain additional information necessary for the proper execution of the Work.
  - 1.1.4.3 Address apparent inconsistencies, errors, or omissions within the Contract Documents.
  - 1.1.4.4 Address unforeseen or unanticipated existing site conditions that impact the Work.
  - 1.1.4.5 Maintain the progress of the Work by providing a timely and efficient communication channel.
- 1.1.5 The RFI process is NOT intended to be used for:
  - 1.1.5.1 Requesting substitutions of specified products or materials. Refer to Section 01 25 00 for substitution procedures.
  - 1.1.5.2 Requesting review of Submittals, Shop Drawings, or Product Data. Refer to Section 01 33 00 for submittal procedures.
  - 1.1.5.3 Seeking general information or asking questions unrelated to the interpretation of the Contract Documents or existing site conditions directly affecting the Work.
  - 1.1.5.4 Requesting coordination information that is already indicated or reasonably inferable from the Contract Documents.
  - 1.1.5.5 Requesting adjustments to the Contract Price or Contract Time.
  - 1.1.5.6 Circumventing other established procedures for changes to the Contract, such as Change Orders or Change Directives.

## **1.2 CONTRACTOR RESPONSIBILITIES PRIOR TO RFI SUBMISSION**

- 1.2.1 Contract Documents are intended to be complementary. Before commencing each portion of the Work, and upon discovery of a potential issue, the Contractor shall:
  - 1.2.1.1 Carefully study and compare all relevant Contract Documents, including Drawings, Specifications, schedules, and other information.
  - 1.2.1.2 Review shop drawings, and previous project communications that may relate to the Work.
  - 1.2.1.3 Examine the existing site conditions and take field measurements to verify dimensions and conditions relevant to the Work.

- 1.2.1.4 Consult with Subcontractors, suppliers, and other relevant parties.
- 1.2.1.5 Discuss the issue at Project progress meetings, where appropriate, to seek informal clarification if possible.
- 1.2.2 Such reviews are for the purpose of facilitating and coordinating the Work and resolving issues through direct reference to the Contract Documents. The RFI process is to be used only when clarification cannot be achieved through diligent review of the Contract Documents.
- 1.2.3 Before submitting an RFI, the Contractor shall undertake a thorough review of the Contract Documents to ensure the required information cannot be resolved by direct reference to them.

### **1.3 RFI PROCEDURE**

- 1.3.1 RFI Initiation:
  - 1.3.1.1 When interpretation, clarification, or explanation of the Contract Documents is required and cannot be resolved through diligent review, the Contractor shall initiate an RFI.
  - 1.3.1.2 RFIs shall originate from the Contractor only. RFIs submitted by entities other than the Contractor will be returned without response.
  - 1.3.1.3 Submit one distinct subject per RFI. Do not combine unrelated items in a single RFI.
  - 1.3.1.4 Number RFIs consecutively in a single sequence for the entire Project (e.g., RFI-001, RFI-002, RFI-003, etc.). Revisions to an RFI shall be identified with the letter R (e.g., RFI-001-R1, RFI-001-R2) using the original RFI number.
- 1.3.2 Each RFI shall be concise, legible, clear, and include the following information:
  - 1.3.2.1 Project name.
  - 1.3.2.2 Date of submittal.
  - 1.3.2.3 Contractor name.
  - 1.3.2.4 Consultant name.
  - 1.3.2.5 RFI number assigned sequentially.
  - 1.3.2.6 RFI subject matter:
  - 1.3.2.7 Specification section number and title, and related paragraph numbers, as applicable.
  - 1.3.2.8 Drawing number and detail references.
  - 1.3.2.9 Detailed description of the issue.
  - 1.3.2.10 Contractor's suggested solutions. Include any suggested solutions that the Contractor believes are reasonable. If the Contractor's suggested solutions have an anticipated impact on the Contract Time or Contract Price, clearly state the potential impact in the RFI.
  - 1.3.2.11 Attachments: Include Drawings, descriptions, measurements, photos, product data, Shop Drawings, and other information necessary to fully describe the items needing interpretation.
  - 1.3.2.12 Contractor's Signature.

- 1.3.2.13 Contractor's suggested priority for response, if multiple RFIs are submitted.
- 1.3.3 RFI Screening by Consultant: The Consultant will screen each RFI upon receipt. The following RFIs may be rejected and returned to the Contractor without action:
  - 1.3.3.1 RFIs that do not demonstrate a thorough review of the Contract Documents.
  - 1.3.3.2 RFIs where the required information is clearly found in the Contract Documents.
  - 1.3.3.3 RFIs requesting approvals, including but not limited to Submittals, Shop Drawings, Product Data, or substitutions.
  - 1.3.3.4 RFIs requesting coordination information already indicated or reasonably inferable from the Contract Documents.
  - 1.3.3.5 Incomplete RFIs or RFIs containing numerous errors.
  - 1.3.3.6 RFIs with unclear or ambiguous questions.
- 1.3.4 RFI Submission Process:
  - 1.3.4.1 Submit RFIs to the Consultant via email. Ensure electronic files are in a text-searchable format (e.g., PDF) where possible.
  - 1.3.4.2 Upon submittal, Contractor is responsible for tracking and logging the RFI.
- 1.3.5 Consultant's Response:
  - 1.3.5.1 The Consultant will review each RFI and determine the appropriate action. The Consultant will endeavor to provide a written response to each RFI within 5 working days of receipt of a complete and clear RFI.
  - 1.3.5.2 If a large number of RFIs are submitted at once, or if RFIs are complex, the Consultant may require additional review time. In such cases, the Consultant will confer with the Contractor within 5 working days of receipt to establish a reasonable response timeframe and prioritize RFIs if necessary. The Contractor shall accommodate such necessary time at no increase in the Contract Time and at no additional cost to the Owner.
  - 1.3.5.3 The Consultant's response will be consistent with the intent of, and reasonably inferable from, the Contract Documents.
  - 1.3.5.4 The Consultant will distribute copies of RFI responses to affected parties, as deemed necessary.
- 1.3.6 RFI Response Review and Action:
  - 1.3.6.1 Upon receipt of the Consultant's response, the Contractor shall promptly review and distribute the response to all affected Subcontractors and suppliers.
  - 1.3.6.2 A response to an RFI shall not be considered a Change Order or Change Directive, nor authorization to proceed with changes that may affect the Contract Price or Contract Time, unless explicitly issued as a formal Change Order or Change Directive by the Owner. Refer to Section 01 26 00.



1.3.7 RFI Log and Tracking:

- 1.3.7.1 The Contractor shall prepare, maintain, and submit a comprehensive and up-to-date tabular RFI log, organized by RFI number.
- 1.3.7.2 The RFI Log shall include, at minimum: RFI Number, Date Submitted, Subject, Specification Section, Drawing Number, Date Response Received, and Current Status.
- 1.3.7.3 Submit updated RFI log at each bi-weekly progress meeting for review and discussion.

END OF SECTION

**PART 1      GENERAL**

**1.1            SUMMARY**

- 1.1.1 This Section specifies payment procedures and expands on payment provisions provided in the General Conditions of the Contract.

**1.2            SCHEDULE OF VALUES**

- 1.2.1 Initial Schedule of Values (in Preparation for Initial Application for Payment):
  - 1.2.1.1 Prior to submitting first application for payment, prepare initial schedule of values.
  - 1.2.1.2 Submit initial schedule of values to the Consultant for review.
  - 1.2.1.3 Make necessary modifications to initial schedule of values as requested by Consultant.
  - 1.2.1.4 Obtain written acceptance from Consultant for modified initial schedule of values.
  - 1.2.1.5 Proceed with first application for payment, only after receiving Consultant's written acceptance.
- 1.2.2 First and Subsequent Applications for Payment:
  - 1.2.2.1 Provide updated versions of schedule of values with first application and all subsequent applications for payment.
  - 1.2.2.2 Updated schedule of values must show values of completed work and delivered products at the Place of the Work up to the date of application for payment.
- 1.2.3 Provide the detailed schedule of values in an electronic format acceptable to Consultant.
- 1.2.4 Provide the schedule of values in an electronic spreadsheet format that provides for inclusion of the following information:
  - 1.2.4.1 Identifying information including title and location of the Work, name of Contractor, number and date of application for payment, and period covered by the application for payment.
  - 1.2.4.2 A work breakdown structure based on Contractor, Subcontractor and sub-Subcontractor work according to each Specification section, and material and labour breakdown. Include separate line items for closeout procedures including closeout submittals, demonstration and training, start-up and testing, and commissioning collectively valued at minimum 0.5% of Contract Price].
  - 1.2.4.3 Provisions for approved Change Orders, allowances, unit price work and assignable contracts (if applicable) so that the breakdown amounts indicated in the schedule of values aggregate to the current total Contract Price. Also provide for indicating the estimated value of Change Directives within the schedule of values, separately from the current total Contract Price.

- 1.2.4.4 For each item in the work breakdown structure, provide as a minimum the following information, under headings as indicated:
- .1 Breakdown Amount: A dollar amount, including an appropriate pro rata portion of Contactor's overhead and profit.
  - .2 Performed to Date: The value of Work performed and Products delivered to Place of the Work up to the date of the application for payment, stated as a percentage of the Contract Price and in dollars.
  - .3 Previously Performed: The value of Work performed and Products delivered to the Place of the Work for which payment has been previously certified, stated in dollars.
  - .4 Current Period: The value of Work performed and Products delivered to Place of the Work for which Contractor is currently applying for payment, stated in dollars.
  - .5 Balance to Complete: The value of Work not yet performed and Products not yet delivered to Place of the Work, stated in dollars.

### **1.3 CASH FLOW PROJECTION**

- 1.3.1 Prior to the first application for payment submit, for Consultant's review, a forecast of approximate monthly progress payments for each month of the Contract Time.
- 1.3.2 Submit revised cash flow forecasts when requested by Consultant. Consultant may also require revised cash flow forecasts when required due to significant changes in rate of progress of the Work or significant changes in the Contract Price.

### **1.4 APPLICATIONS FOR PAYMENT AND "PROPER INVOICE" PROCEDURES**

- 1.4.1 Make applications for payment on account as provided in CCDC 2, 2020 Part 5 PAYMENT as Work progresses. In particular, conform to GC 5.2 and GC 5.3 respectively.
- 1.4.2 A payment review meeting will be organized by Contractor prior to the end of each monthly billing period. Payment review meeting must occur prior to submitting applications for payment. Refer to Supplementary Conditions for invoicing procedures.

### **1.5 WORKERS' COMPENSATION CLEARANCE**

- 1.5.1 Submit proof of workers' compensation WSIB clearance with each application for payment.

### **1.6 STATUTORY DECLARATIONS**

- 1.6.1 Submit a statutory declaration in the form of CCDC 9A – Statutory Declaration of Progress Payment Distribution by Contractor with each application for payment except the first.

**1.7 PAYMENT FOR PRODUCTS STORED OFF SITE**

- 1.7.1 Owner will not make payments for Products delivered to and stored at a location other than Place of the Work.

**1.8 SUBSTANTIAL PERFORMANCE AND RELEASE OF HOLDBACK**

- 1.8.1 Substantial Performance shall be defined under the terms and conditions of the Construction Act.
- 1.8.2 The Project shall be determined completed by the Consultant in accordance with requirements of the Construction Act.
- 1.8.3 Release of Holdback: As specified in Supplementary Conditions.

**END OF SECTION**

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**PART 1      GENERAL**

**1.1           LIST OF SUBCONTRACTORS**

- 1.1.1 Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
  - 1.1.1.1 Name, address, telephone number, and email address of entity performing Subcontract or supplying products.
  - 1.1.1.2 Number and title of related Specification Section(s) covered by Subcontract.
  - 1.1.1.3 Drawing number and detail references, as appropriate, covered by Subcontract.
- 1.1.2 Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses, cellular telephone numbers, and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
- 1.1.3 Post copies of list in Project meeting room, in temporary field office, and in prominent location. Keep list current at all times.

**1.2           GENERAL COORDINATION PROCEDURES**

- 1.2.1 Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.
  - 1.2.1.1 Schedule construction operations in sequence required to obtain the best results, where installation of one part of the Work depends on installation of other components, before or after its own installation.
  - 1.2.1.2 Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
  - 1.2.1.3 Make adequate provisions to accommodate items scheduled for later installation.
- 1.2.2 Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
  - 1.2.2.1 Prepare similar memoranda for Owner and Owner's Contractors if coordination of their Work is required.

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### **1.3 COORDINATION/INTERFERENCE DRAWINGS**

- 1.3.1 Prepare coordination/interference drawings according to requirements in individual Sections, and additionally where installation is not completely indicated on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
  - 1.3.1.1 Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination/interference drawings on standard printed data. Include the following information, as applicable:
    - 1.3.1.2 Use applicable Drawings as a basis for preparation of coordination/interference drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
    - 1.3.1.3 Coordinate the addition of trade-specific information to coordination/interference drawings in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
      - .1 Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
      - .2 Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
      - .3 Show location and size of access doors required for access to concealed dampers, valves, and other controls.
      - .4 Indicate required installation sequences.
      - .5 Indicate dimensions shown on Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternative sketches to Consultant indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
- 1.3.2 Coordination Drawing Organization: Organize coordination/interference drawings as follows:
  - 1.3.2.1 Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
  - 1.3.2.2 Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within plenums to accommodate layout of light

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- fixtures and other components indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
- 1.3.2.3 Mechanical Rooms: Provide coordination/interference drawings for mechanical rooms, showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
- 1.3.2.4 Structural Penetrations: Indicate penetrations and openings required for all disciplines.
- 1.3.2.5 Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
- 1.3.2.6 Mechanical and Plumbing Work: Show the following:
- .1 Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
  - .2 Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
  - .3 Fire-rated enclosures around ductwork.
- 1.3.2.7 Electrical Work: Show the following:
- .1 Runs of vertical and horizontal conduit 32 mm (1-1/4 inches) in diameter and larger.
  - .2 Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
  - .3 Panel board, switchboard, switchgear, transformer, busway, generator, and motor-control center locations.
  - .4 Location of pull boxes and junction boxes, dimensioned from column center lines.
- 1.3.2.8 Fire-Protection System: Show the following:
- .1 Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
- 1.3.3 Review: Consultant will review coordination/interference drawings to confirm that, in general, the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Consultant determines that coordination/interference drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Consultant will so inform Contractor, who shall make suitable modifications and resubmit.
- 1.3.4 Coordination Drawing Process: Prepare coordination/interference drawings in the following manner:
- 1.3.4.1 Schedule submission and review of Fire Sprinkler, Plumbing, HVAC, and Electrical Shop Drawings to make necessary changes before preparing coordination/interference Drawings.

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- 1.3.4.2 Begin routing coordination/interference drawing files with HVAC Subcontractor, who will provide approved ductwork plans using a specific colour. Ductwork and piping will be located on a single layer. Forward drawings to Plumbing Subcontractor.
- 1.3.4.3 Plumbing Subcontractor will locate the plumbing and equipment on a single layer, using a designated color.
- 1.3.4.4 Fire Sprinkler Subcontractor will locate piping and equipment using a specific colour. Fire Sprinkler Subcontractor will then send Drawing files to Electrical Subcontractor.
- 1.3.4.5 Electrical Subcontractor will indicate the service and feeder conduit runs and equipment in a specific colour. Electrical Subcontractor will forward drawing files to Communications and Electronic Safety and Security Subcontractor.
- 1.3.4.6 Communications and Electronic Safety and Security Subcontractor will indicate cable trays, cabling runs, and equipment in a specific color. Communications and Electronic Safety and Security Subcontractor will then send completed drawing files to General Contractor.
- 1.3.4.7 Contractor will perform final coordination review. After each coordination/interference drawing is completed, Contractor will meet with Consultant to review and resolve conflicts in coordination/interference drawings.
- 1.3.4.8 Final selection of colours for each discipline will be as proposed by each discipline, subject to confirmation by Consultant and Owner.
- 1.3.5 Prepare coordination digital data files according to the following requirements:
  - 1.3.5.1 Prepare coordination/interference documents in same digital data software program, version, and operating system as original Drawings.

#### **1.4 DIGITAL DATA FILES**

- 1.4.1 Consultant will provide digital data files for Contractor's use during construction process and for preparation of as-builts documents subject to the execution of a Data Licensing Agreement. Refer to Section 01 11 00 for additional information.

**END OF SECTION**



**PART 1        GENERAL**

**1.1            CONTRACTOR'S RESPONSIBILITIES**

- 1.1.1 Unless specified otherwise, Contractor's responsibilities for project meetings, except for Preconstruction Meeting, are as follows:
  - 1.1.1.1 Schedule and conduct meetings and meetings at Project site unless otherwise indicated.
  - 1.1.1.2 Prepare agenda for meetings. Distribute the agenda to all invited attendees.
  - 1.1.1.3 Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Consultant of scheduled meeting dates and times a minimum of 10 working days prior to meeting.
  - 1.1.1.4 Provide physical space and make arrangements for meetings (e.g., virtual meeting links if applicable).
  - 1.1.1.5 Preside at meetings.
  - 1.1.1.6 Record meeting minutes. Include significant proceedings and decisions. Identify actions by parties.
  - 1.1.1.7 Distribute copies of minutes within three days after meetings and transmit to meeting participants and, affected parties not in attendance.

**1.2            PRECONSTRUCTION "KICK OFF" MEETING**

- 1.2.1 Consultant will schedule a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities, at a time convenient to Owner and Consultant, but no later than 15 days after award of Contract.
- 1.2.2 Notice: Consultant will endeavour to provide a minimum of 4 working days' notice to required attendees.
- 1.2.3 Attendees:
  - 1.2.3.1 Authorized representative of Consultant, Owner (Owner's Project Manager and relevant stakeholders), Contractor, major Subcontractors, field inspectors, Commissioning Agents, supervisors, suppliers; and other concerned parties will be in attendance.
  - 1.2.3.2 Participants at the meeting must be familiar with Project and authorized to conclude matters relating to the Work.
- 1.2.4 Agenda: Discuss items of significance that could affect progress, including the following:
  - 1.2.4.1 Designation of key personnel and their duties for Owner, Consultant, Contractor, and Subcontractors.
  - 1.2.4.2 Lines of Communication: Establish primary contacts and procedures for official correspondence
  - 1.2.4.3 Contractual Requirements:

- .1 Review of Contract Documents distribution.
- .2 Review bonding, Project, Insurance Certificates, WSIB Clearance Certificate, Contractor H&S Program, Training Certifications (CSA Z317.13, Working at Heights, First Aid, etc.)
- .3 Review tentative schedule, critical path, work sequencing, long-lead items, and phasing.
- 1.2.4.4 Owner-specific procedures: Review requirements including, but not limited to, mandatory orientation, health and safety, infection prevention and control, site audits, IMT coordination, Owner's policies and procedures, activity permits, communicable illnesses, fire safety, site security, site logistics, requirements for system bypasses and shutdowns, hoarding requirements, site rules and conduct and disruptive work.
- 1.2.4.5 Administrative Procedures: Review RFI procedures, change management (CCN/CCOs, CDs, CADA etc.), submittal procedures, payment procedures, testing and inspecting procedures, closeout procedures, requirements for substantial performance, occupancy requirements, take-over procedures, acceptance, and warranties.

### **1.3 PROGRESS MEETINGS**

- 1.3.1 During course of Work, Contractor shall schedule progress meetings bi-weekly or on a mutually acceptable frequency.
- 1.3.2 Coordinate dates of meetings with preparation of draft applications for progress payment.
- 1.3.3 Contractor shall record in the meeting minutes significant decisions and identify action items and action dates by attendees or the parties they represent.
- 1.3.4 Contractor shall distribute copies of minutes within three Working Days after each meeting to meeting attendees and any affected parties who may not be in attendance.
- 1.3.5 Attendees:
  - 1.3.5.1 In addition to representatives of Owner and Consultant, Contractor, and each subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings.
  - 1.3.5.2 Participants at the meeting must be familiar with Project and authorized to conclude matters relating to the Work.
- 1.3.6 Agenda: to include the following:
  - 1.3.6.1 Review, approval of minutes of previous meeting.
  - 1.3.6.2 Review of Work Progress: Compare actual progress to Construction Schedule. Identify activities ahead, on time, or behind schedule. Discuss corrective measures for delays and secure commitments. Discuss need for schedule revisions.
  - 1.3.6.3 Schedule Review: Review schedule for the next work period. Update Construction Schedule as necessary and issue with minutes if revised.

- 1.3.6.4 Review compliance with Owner's site procedures (Health and Safety, IPAC, Security, Site Conduct, etc.). Discuss findings from recent Health and Safety or IPAC audits and status of corrective actions.
- 1.3.6.5 Interface requirements.
- 1.3.6.6 Sequence of operations.
- 1.3.6.7 Field observations, problems, conflicts.
- 1.3.6.8 Problems which impede construction schedule.
- 1.3.6.9 Review of off-site fabrication delivery schedules.
- 1.3.6.10 Maintenance of quality standards.
- 1.3.6.11 Review proposed changes for effect on construction schedule and on completion date.
- 1.3.6.12 Other business.
- 1.3.6.13 Status of submittals.
- 1.3.6.14 Status of sustainable design documentation.
- 1.3.6.15 Deliveries.
- 1.3.6.16 Status of RFIs.
- 1.3.6.17 Status of Proposed Changes.
- 1.3.6.18 Status of Change Orders.
- 1.3.6.19 Pending claims and disputes.
- 1.3.6.20 Documentation of information for payment requests.

#### **1.4 PREINSTALLATION MEETINGS**

- 1.4.1 Conduct a preinstallation meeting at Project site before each construction activity when required by other Sections and when required for coordination with other construction.
- 1.4.2 Attendees:
  - 1.4.2.1 Subcontractor and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Consultant of scheduled meeting dates at least 72 hours in advance.
- 1.4.3 Agenda:
  - 1.4.3.1 Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
    - .1 Contract Documents.
    - .2 Options.
    - .3 Related RFIs.
    - .4 Related Change Orders.
    - .5 Purchases.
    - .6 Deliveries.

- .7 Submittals.
- .8 Review of mockups.
- .9 Possible conflicts.
- .10 Compatibility requirements.
- .11 Time schedules.
- .12 Weather limitations.
- .13 Manufacturer's written instructions.
- .14 Warranty requirements.
- .15 Compatibility of materials.
- .16 Acceptability of substrates.
- .17 Temporary facilities and controls.
- .18 Space and access limitations.
- .19 Regulations of authorities having jurisdiction.
- .20 Testing and inspecting requirements.
- .21 Installation procedures.
- .22 Coordination with other work.
- .23 Required performance results.
- .24 Protection of adjacent work.
- .25 Protection of construction and personnel.
- .26 Owner-specific requirements (Health and Safety, IPAC, Security, Activity Permits etc.).
- 1.4.3.2 Record significant meeting discussions, agreements, and disagreements, including required corrective measures and actions.
- 1.4.3.3 Do not proceed with installation if the meeting cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the meeting at earliest feasible date.

END OF SECTION

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## **PART 1      GENERAL**

### **1.1            CONSTRUCTION PROGRESS SCHEDULE**

#### **1.1.1    Format and Content:**

- 1.1.1.1**    Prepare schedule in the form of a Critical Path Method (CPM) Gantt chart using appropriate scheduling software (Microsoft Project or similar).
- 1.1.1.2**    Provide a work breakdown structure identifying key activities, work packages, and major milestones, including long delivery Products, inspection and testing activities, preparation and review of mock-ups, Owner decisions for cash allowances, shutdown or closure activities, delivery of Owner supplied Products (if any), Owner performed work, demonstration and training activities, and similar items, at a sufficient level of detail to effectively manage construction progress.

#### **1.1.2    Submission:**

- 1.1.2.1**    Submit initial schedule to Owner and Consultant within 15 Working Days after Contract award.
- 1.1.2.2**    Submit schedule via e-mail as .pdf files and Microsoft Project formats.
- 1.1.2.3**    Consultant will review format and content of initial schedule and request necessary changes, if any, within 10 Working Days after receipt.
- 1.1.2.4**    If changes are required, resubmit finalized initial schedule within 7 Working Days after return of review copy.
- 1.1.2.5**    Submit updated progress schedule monthly to Consultant, indicating actual and projected start and finish dates with report date line and progress, activity relationships, critical path, float, and baseline comparison to current progress.
- 1.1.2.6**    If requested by Consultant, include a written report with updated progress schedules. Indicate work status to date comparing baseline to actual progress, current forecasts, identifying problem areas, anticipated delays and impact on schedule, and planned corrective actions.

### **1.2            SHORT-TERM LOOK AHEAD SCHEDULE**

- 1.2.1**    On a bi-weekly basis, prepare for discussion at progress meetings, a 2-week short-term schedule based on construction schedule in tabular format. Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next construction schedule update. The short-term schedule shall be a standing agenda item for progress meetings

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- 1.2.2 Provide sufficient information on progress of The Work to enable a status report to be produced on a bi-weekly basis. Indicate on short-term schedule, construction activities that the Owner and Consultant deem necessary.

### **1.3 SUBMITTALS SCHEDULE**

#### **1.3.1 Format and Content:**

- 1.3.1.1 Prepare schedule identifying all required Shop Drawing, Product data, and sample submissions, including samples required for testing and including those for Owner supplied Products, if any.
- 1.3.1.2 Prepare schedule in electronic format.
- 1.3.1.3 Provide a separate line for each required submittal, organized by Specifications section names and numbers, and further broken down by individual Products and systems as required.
- 1.3.1.4 For each required submittal, show planned earliest date for initial submittal, earliest date for return of reviewed submittal by Consultant and latest date for return of reviewed submittal without causing delay.
- 1.3.1.5 Allow time in schedule for resubmission of submittals, should resubmission be necessary.

#### **1.3.2 Submission:**

- 1.3.2.1 Submit initial schedule to Consultant within 15 Working Days after Contract award.
- 1.3.2.2 Submit schedule via e-mail as .pdf files.
- 1.3.2.3 Consultant will review format and content of initial schedule and request necessary changes, if any, within 10 Working Days after receipt.
- 1.3.2.4 If changes are required, resubmit finalized schedule within 5 Working Days after return of review copy.
- 1.3.2.5 Submit updated submittals schedule monthly to Consultant.

### **1.4 SCHEDULE MANAGEMENT**

- 1.4.1 A schedule submitted as specified and accepted by Consultant shall become the baseline schedule and shall be used as the baseline for updates.
- 1.4.2 At each regular progress meeting, review and discuss current construction progress and submittals schedules with Consultant and Owner, including activities that are behind schedule and planned measures to regain schedule slippage in key areas on or near the critical path.
- 1.4.3 Activities considered behind schedule are those with start or completion dates later than the dates shown on the baseline schedule.

### **1.5 RECORDING ACTUAL SITE CONDITIONS ON AS-BUILT DRAWINGS**

- 1.5.1 A digital copy of construction Drawings will be provided to Contractor. Contractor is responsible for printing hard copy set of construction Drawings for the purpose

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of creating as-built drawings. Record information and maintain as-built drawings in clean, dry and legible condition.

- 1.5.2 Record information clearly identifying as-built deviations from the originally obtained construction Drawings.
- 1.5.3 Clearly label each drawing as "AS-BUILT DRAWING". Record information concurrently with construction progress. Do not conceal Work until required information is recorded.
- 1.5.4 Record actual construction including:
  - 1.5.4.1 Measured depths of elements of foundation in relation to finish first floor datum.
  - 1.5.4.2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
  - 1.5.4.3 Measured locations of pipes, ducts, conduits, outlets, fixtures, access panels, and appurtenances, referenced to visible and accessible features of construction.
  - 1.5.4.4 Field changes of dimension and detail.
  - 1.5.4.5 Changes made by Change Orders and Supplemental Instructions
  - 1.5.4.6 References to Shop Drawings, where Shop Drawings show more detail.
- 1.5.5 Do not use as-built drawings for construction purposes.
- 1.5.6 Refer to Section 01 78 00 for submission requirements at project closeout.

## **1.6 PROGRESS PHOTOGRAPHS**

- 1.6.1 Periodic Construction Photographs: Take photographs and submit monthly by email coinciding with the cutoff date associated with each application for progress payment. Select vantage points to show status of construction and progress since last photographs were taken.
- 1.6.2 Preconstruction Photographs: Before commencement of the Work, take photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by Consultant. Concealed Work Photographs: Before proceeding with installing work that will conceal other work, take photographs sufficient in number, with annotated descriptions, to record nature and location of concealed Work.
- 1.6.3 Format: Submit photographs in .jpg format.
- 1.6.4 Additional Photographs: Consultant may request photographs in addition to periodic photographs specified.
  - 1.6.4.1 Circumstances that could require additional photographs include, but are not limited to, the following:
    - .1 Special events planned at Project site.
    - .2 Immediate follow-up when on-site events result in construction damage or losses.

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- .3 Completion of a major phase or component of the Work such as excavation, foundation or framing.
- .4 Owner's request for special publicity photographs.

END OF SECTION



## **1.1 SUBMITTAL PROCEDURES, GENERALLY**

- 1.1.1 Schedule of Submittals: As specified in Section 01 32 00.
- 1.1.2 Language: Provide submittals in the language of the Contract (i.e. English). Submittals in other languages will be rejected.
- 1.1.3 Submission Timing: Make submittals to the Consultant promptly and in an orderly sequence to avoid project delays. Late submissions will not justify contract time extensions, product substitutions, or deviations.
- 1.1.4 Regulatory Approvals: Make submittals to authorities having jurisdiction where required and provide proof of compliance to the Consultant. Obtain final approval from authorities having jurisdiction before submitting to the Consultant.
- 1.1.5 Format: Make submittals via email as searchable .pdf files. Ensure PDF files are legible and not password protected.
- 1.1.6 Measurement Units: Present Shop Drawings, Product Data, and samples in SI metric units unless otherwise indicated.
- 1.1.7 Contractor Review: Review submittals, provide verified field measurements where applicable, and affix Contractor's review stamp prior to submission to Consultant. Contractor's review stamp represents that necessary requirements have been determined and verified, and that the submittal has been checked and coordinated with requirements of the Work and Contract Documents.
- 1.1.8 No Substitutions: Do not propose substitutions or deviations through submittals. Submit requests separately per Section 01 25 00.
- 1.1.9 RFIs: Do not use submittals for RFIs. Submit RFIs separately per Section 01 26 13.
- 1.1.10 Documentation: Record submittal reviews, inspections, and testing reports for inclusion in project closeout documents.
- 1.1.11 On-Site Copy: Maintain one reviewed copy of each submittal on-site.
- 1.1.12 Submittal Process:
  - 1.1.12.1 Assemble submittals and transmit to Consultant by sending via email. Include PDF transmittal form. Include information in email subject line clearly identifying project name, project no, and submittal scope. Consider using a project document management system for submittals on larger projects.
  - 1.1.12.2 Compliance: Submit only items specified in the Contract Documents. Unspecified items will be returned without review.
  - 1.1.12.3 Submittal Requirements: Submittals must be stamped, signed, and dated by the Contractor. Unstamped submittals will be returned without review.
  - 1.1.12.4 Deviations: Clearly highlight and document deviations from Contract Documents at the time of submission with written justification.
  - 1.1.12.5 Processing Time: Allow time for submittal review, including time for resubmittals, as follows.

- .1 Time for review shall commence on Consultant's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
  - .2 Initial Review: Allow a minimum of 10 working days for initial review of each submittal. Complex submittals may require longer review periods. The Consultant will notify the Contractor if a submittal requires extended review time beyond the initial submittal review timeline. Allow additional time if coordination with subsequent submittals is required. Consultant will advise Contractor when a submittal being processed must be delayed for coordination.
  - .3 Resubmittal Review: Allow minimum of 15 working days for review of each resubmittal.
- 1.1.12.6 On each submittal:
- .1 Clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Consultant on previous submittals.
  - .2 Indicate by highlighting on each submittal or noting on attached separate sheet.
  - .3 Delete information not applicable to project.
  - .4 Supplement standard information to provide details applicable to project.
  - .5 Identify options requiring selection by Consultant.
- 1.1.13 Submittals Format: Submit electronic copies of each submittal unless otherwise indicated. Include the following information in each submittal:
- 1.1.13.1 Date and revision dates.
  - 1.1.13.2 Project title and number.
  - 1.1.13.3 Location(s) where product is to be installed, as appropriate.
  - 1.1.13.4 Other necessary identification.
  - 1.1.13.5 Remarks.
  - 1.1.13.6 Transmittal letter, containing:
    - .1 Date.
    - .2 Project title and number.
    - .3 Contractor's name and address.
    - .4 Unique submittal number, including revision identifier. Include Specification Section number with sequential alphanumeric identifier and alphanumeric suffix for resubmittals.
    - .5 Submittal purpose and description.
    - .6 Signature of transmitter.
    - .7 Other pertinent data.

- 1.1.13.7 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- 1.1.14 Consultant's Review:
  - 1.1.14.1 Consultant will perform general review of The Work for general conformance with Contract Documents, Code and authorities having jurisdiction. Review includes review of Shop Drawings, review of field Work and review of reports produced by various inspection and testing agencies.
  - 1.1.14.2 Consultant review does not relieve the Contractor of responsibility for errors, omissions, or deviations from Contract Documents.
    - .1 Review of Contractors' submittals by Consultant is for the purpose of verifying general conformance with the design intent and overall project requirements.
    - .2 This review shall not mean that Consultant approves detail design inherent in submittals, responsibility for which shall remain with Contractor, and such review shall not relieve Contractor of responsibility for errors or omissions or of responsibility for meeting requirements of Contract Documents.
    - .3 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.
  - 1.1.14.3 Do not proceed with or fabricate work affected by a submittal until the Consultant's review is complete.
  - 1.1.14.4 Consultant will review each submittal, indicate corrections or revisions required, and return annotated files to Contractor. Consultant will indicate, via markup on each submittal, the appropriate action, as follows:
    - .1 REVIEWED or REVIEWED AS NOTED: Upon review by Consultant, no apparent errors or omissions are discovered by Consultant with respect to the general design intent, or only minor corrections are to be made. Copies will be returned to Contractor and fabrication and installation of Work may proceed. This review is to confirm general conformance with the design concept and overall project requirements, but does not constitute a detailed review of dimensions, quantities, fabrication methods, or construction techniques, which remain the Contractor's responsibility.
    - .2 REVISE AND RESUBMIT: Make changes as Consultant may require, consistent with Contract Documents. When resubmitting, notify Consultant in writing of revisions other than those requested. Contractor shall resubmit corrected submittals within 5 working days of receiving the rejected submittal.
  - 1.1.14.5 Do not fabricate any portion of the Work until Shop Drawings are indicated as "REVIEWED or REVIEWED AS NOTED".

- 1.1.14.6 Do not resubmit Shop Drawings indicated as "REVIEWED or REVIEWED AS NOTED"
- 1.1.14.7 Resubmit Shop Drawings indicated as "REVISE AND RESUBMIT" with required changes and comments addressed. Insert letter "R" after Shop Drawing number on resubmitted Shop Drawings. Re-date and re-sign resubmitted Shop Drawings. Clearly identify all revisions from previous submissions, graphically clouding revisions on drawings and providing a revision log.

## **1.2 INITIAL ADMINISTRATIVE SUBMITTALS**

- 1.2.1 Immediately after receiving notification of award of Contract or as required by the General Conditions or Supplementary Conditions of the Contract, submit the following:
  - 1.2.1.1 Proof of good standing with the applicable workers' compensation authority (e.g. WSIB Clearance Certificate for Ontario).
  - 1.2.1.2 Certificates of Insurance confirming required coverage.
  - 1.2.1.3 Contract Security as required by the Contract Documents.
  - 1.2.1.4 Other initial certificates, permits, or transcripts required by Contract Documents or authorities having jurisdiction.
- 1.2.2 Subcontractor List: Within 10 working days of Contract Award or start of construction, submit a list identifying individuals or firms proposed for major portions of the Work, including specially fabricated items. Include:
  - 1.2.2.1 Name, address, telephone number, and email address.
  - 1.2.2.2 Relevant Specification Section(s).
  - 1.2.2.3 Relevant Drawing number(s) or detail reference(s).
- 1.2.3 Key Personnel List: Within 10 working days of starting construction operations, submit a list of key personnel assignments (superintendent, project manager, site safety officer, etc.).
  - 1.2.3.1 Include the following:
    - .1 Individual's name, duties, responsibilities.
    - .2 Contact information (address, mobile phone, email).
    - .3 Designated alternates.
- 1.2.4 Post copies of the Key Personnel list in the Project meeting room and site office. Keep lists current.

## **1.3 PRODUCT DATA SHEETS**

- 1.3.1 Mark product data sheets to show applicable Products and options. Include the following:
  - 1.3.1.1 Manufacturer's written recommendations, Product Specifications, and installation instructions.
  - 1.3.1.2 Wiring diagrams showing factory-installed wiring.
  - 1.3.1.3 Printed performance curves and operational range diagrams.
  - 1.3.1.4 Testing by recognized testing agency.

1.3.1.5 Compliance with specified standards and requirements.

#### **1.4 SHOP DRAWINGS**

1.4.1 Provide Shop Drawings required by Contract Documents. Insert Contractor's review stamp complete with date and signature of Contractor's reviewer.

1.4.2 Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1.4.3 Include the following on Shop Drawings as applicable:

1.4.3.1 Project-specific information, drawn accurately to scale.

1.4.3.2 fabrication methods.

1.4.3.3 layout, showing dimensions, including verified field dimensions, and clearances.

1.4.3.4 plans, sections and details;

1.4.3.5 materials thicknesses and finishes;

1.4.3.6 setting, erection and sealing details.

1.4.3.7 methods of securing, fastening and anchoring including field connections.

1.4.3.8 capacities.

1.4.3.9 performance characteristics.

1.4.3.10 standards.

1.4.3.11 operating weight.

1.4.3.12 wiring diagrams.

1.4.3.13 single line and schematic diagrams.

1.4.3.14 relationship to adjacent work.

1.4.3.15 engineer's stamp (as applicable)

#### **1.5 DELEGATED-DESIGN SUBMITTALS**

1.5.1 In addition to Shop Drawings, Product Data, and other required submittals, submit statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to the Contractor to be designed or certified by a design professional.

1.5.2 Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

#### **1.6 SAMPLES**

1.6.1 Submit samples for Consultant's review where specified in the technical Specifications as requested. Label samples as to origin, Project name, and intended use.

1.6.2 Submit Samples for review of kind, colour, pattern, and texture and for a comparison of these characteristics between submittal and actual component as delivered and installed. Include name of manufacturer and Product name on label.

1.6.3 Deliver Sample to Consultant's business address.

- 1.6.4 For each sample, exhibit materials and finishes, such as colour (including maximum colour range within each specified colour), sheen, tone, texture, range of blemishes and other markings. Where colour, pattern or texture is criterion, submit full range of samples.
- 1.6.5 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.
- 1.6.6 Contractor may be asked to remove and discard Products for which samples have not been reviewed and accepted by Consultant.
- 1.6.7 Consultant selection from samples is not intended to change the Contract Price or Contract Time. If a selection would affect the Contract Price or Contract Time, notify Consultant in writing prior to proceeding with the Work.
- 1.6.8 Resubmit samples as required by Consultant to comply with Contract Documents.
- 1.6.9 Reviewed and accepted samples will establish the standard against which installed Work will be reviewed.
- 1.6.10 Colours:
  - 1.6.10.1 Where a required colour, pattern or texture has not been specified, submit full range of available Products meeting other specified requirements.
  - 1.6.10.2 Obtain direction on colours and gloss values in advance of need. If requested, submit samples for colour and gloss selection.
  - 1.6.10.3 Comply with colour schedule provided by Consultant and use colours and glosses designated.

## **1.7 OTHER SUBMITTALS**

- 1.7.1 When required by Contract Documents, submit informational and miscellaneous submittals required by Contract Documents (e.g. plans, reports, certifications, results, records, and similar submittals) for Consultant's review.
- 1.7.2 Test Reports:
  - 1.7.2.1 Submit test reports in accordance with requirements of specification Sections and as requested by Consultant.
  - 1.7.2.2 Reports must be signed by authorized official of testing laboratory and indicate that material, Product or system is identical to material, Product or system to be provided for Project, and has been tested in accordance with specified requirements.
  - 1.7.2.3 Testing must have been within three years of date of Contract award.
- 1.7.3 Certificates:
  - 1.7.3.1 Submit certificates in accordance with requirements of specification Sections and as requested by Consultant.
  - 1.7.3.2 Statements must be printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material, and attesting that product, system or material meets specification requirements.

- 1.7.3.3 Certificates must be project-specific, clearly indicated Project name, and dated after date of Contract award.

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## **PART 1      GENERAL**

### **1.1      SUMMARY**

- 1.1.1 The purpose of this Section is to provide guidance for maintaining infection, prevention and control during activities such as construction and renovation - particularly, to prevent mold spores or other bioaerosols from being generated or released into the air. These spores can result in serious complications, and potentially death, for immuno-compromised individuals.
- 1.1.2 This Section covers minimum requirements for infection prevention and control measures. Comply with specific requirements and measures for infection prevention and control indicated and/or required by the Owner for its facility and as appended to Section 01 35 00. Any exception to this Section or to CSA Z317.13 is at the discretion of the Owner.

### **1.2      PRELIMINARY INFECTION PREVENTION AND CONTROL RISK ASSESSMENT**

- 1.2.1 Initiate and perform the Work in strict accordance with preventative measure requirements identified in CSA Z317.13. The Owner has performed a preliminary infection prevention and control risk assessment for the Project as follows:
  - 1.2.1.1 Population Risk Group: 4
  - 1.2.1.2 Construction Activity Type: D
  - 1.2.1.3 Preventive Measure: IV
  - 1.2.1.4 Final classification shall be confirmed with the Owner's Infection Prevention & Control (IP&C) department as part of the pre-construction risk assessment.
- 1.2.2 Any deviation/changes to this classification must be approved by the Owner.
- 1.2.3 An infection prevention and control risk assessment shall be performed for any work required to be performed outside the boundaries of the Place of the Work prior to the work being undertaken. Do not commence any such work without Owner's express written permission.

### **1.3      ADMINISTRATIVE REQUIREMENTS**

- 1.3.1 Any person performing work within Owner's facility shall be required to comply with the requirements of CSA Z317.13 and these infection prevention and control guidelines at all times. They shall also be required to attend any meetings, supporting training courses and/or orientation sessions requested by the Owner.
- 1.3.2 Plan with Owner and implement preventative measures throughout duration of Contract. Educate all personnel on site regarding planned construction activity, location, duration, population risk group to ensure preventative measures are identified, initiated and maintained. Establish clear line of communication among those involved in this Project.



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1.3.3 Be aware that ongoing functions and activities of existing facility will continue at all times. Owner may, at any given time, request that any work of Contract be temporarily ceased without additional costs.

1.3.4 Preinstallation Meeting:

1.3.4.1 Prior to commencing work perform pre-construction risk assessment. As a minimum thoroughly review the following requirements:

1.3.4.2 Infection prevention and control requirements

1.3.4.3 Interim life safety measures

1.3.4.4 Utility disruptions,

1.3.4.5 Noise and vibration.

#### **1.4 QUALITY ASSURANCE**

1.4.1 Certifications:

1.4.1.1 Ensure that any person performing Work on Owner's facility is familiar with the contents of the following training courses:

.1 Fundamentals of Infection Control During Construction, Renovation and Maintenance of Healthcare Facilities

.2 Effective Implementation and Practical Applications of Infection Control During Construction, Renovation and Maintenance of Health Care Facilities

1.4.1.2 At least one member of Contractor's team permanently assigned to Project shall have received formal training in at least one of the aforementioned courses. Submit proof of training upon request.

#### **1.5 DELIVERY, STORAGE AND HANDLING**

1.5.1 Delivery and Acceptance Requirements:

1.5.1.1 Inspect materials upon delivery for traces or evidence of moisture damage. In particular, perform moisture tests on any porous materials (e.g., gypsum board, wood panels, ceiling tiles, wall coverings etc.) that have been damaged by moisture.

1.5.1.2 Decontaminate materials that have been damaged or replace materials that cannot suitably be decontaminated.

1.5.2 Storage and Handling Requirements:

1.5.2.1 Protect materials used on the building interior from exposure to dust and moisture during delivery, unloading, storage and construction by wrapping materials in impervious plastic wraps or similar methods.

1.5.2.2 Avoid stockpiling porous building materials susceptible to contaminants and moisture damage in exposed areas.

1.5.2.3 Handle ductwork in accordance with "Advanced Level" requirements of SMACNA Duct Cleanliness for New Construction Guidelines. Ensure openings in mechanical equipment and ductwork are sealed before shipping. Implement measures to ensure that seals are not damaged

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during shipping or handling. Do not remove seals until equipment is installed and functioning without interruption.

- 1.5.2.4 Do not deliver woven fabrics, fabric-covered products, and wood-based composite core products until scheduled storage/installation areas are determined to be free from significant risk of water intrusion.
- 1.5.2.5 Decontaminate materials that have been damaged or replace materials that cannot suitably be decontaminated.

## **1.6 SUBMITTALS**

### **1.6.1 Contractor's Infection Prevention and Control Plan:**

- 1.6.1.1 Submit to Owner and Consultant infection prevention and control plan for review prior to starting any construction activity. As a minimum indicate the following:

- .1 Preventative measures analysis in accordance with CSA Z317.13 detailing the following:
  - .1 Population risk group of construction area (1),
  - .2 immediate adjacencies (horizontal and vertical),
  - .3 areas not indicated on Contract Documents yet impacted by construction activities (e.g., connected by ducts, conduit, other means),
  - .4 Construction activity type (C),
  - .5 Preventive measure (II),
  - .6 Any additional information.
- .2 Proposed construction sequence and detailed staging requirements (as applicable)
- .3 Proposed traffic patterns for construction workers and debris that avoid patient care areas.
- .4 Proposed methods for maintaining negative air pressure in construction space, exhaust locations and HVAC sealing techniques.
- .5 Dust mitigation strategies.
- .6 Contingency and emergency remediation plans for water damage control and mould amplification.
- .7 Shop Drawings detailing locations of infection controls barriers, anterooms and their construction.
- .8 Name of primary contact person on Contractor's staff for infection prevention and control.
- .9 Proposed materials and equipment used in construction including but not limited to HEPA filtered construction air handling units, vacuums, portable containment units, tacky mats etc.

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- 1.6.1.2 Upon review and acceptance of Contractor's infection prevention and control plan, Owner shall issue a site permit. Post site permit clearly at Project's site entrance.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- 2.1.1 Tacky Mat: "Clean-Walk Unframed Mat, 5836" by 3M Canada; [www.3mcandada.ca](http://www.3mcandada.ca) or equivalent. Provide mats minimum 635 mm wide x 1143 mm long (25" x 45").
- 2.1.2 Polyethylene: minimum 0.152 mm (6 mil) thick fire-retardant material.
- 2.1.2.1 Acceptable Products: Polyweave Flame Retardant Fabric by Polytarp Products; [www.polytarp.com](http://www.polytarp.com) or PM Fire Retardant Fabric by Inland Plastics Ltd; [www.inlandplastics.com](http://www.inlandplastics.com) or approved equivalent.
- 2.1.3 Gypsum Board:
- 2.1.3.1 15.9 mm (5/8") (Type X) thick moisture-resistant board conforming to ASTM C1658M and ASTM C1396M. Provide one of the following:
- .1 "Dens Armor Plus High-Performance Interior Panel" by Georgia-Pacific Canada, Inc.
  - .2 "SheetRock Brand Glass-Mat Panel – Mold Tough" by CGC
  - .3 "TougRock MoldGuard" by Georgia-Pacific Canada, Inc.,
  - .4 "M2Tech Moisture and Mold Resistant Board" by CertainTeed Gypsum, Canada Inc.
  - .5 "AirRenew® Gypsum Board" by CertainTeed Gypsum, Canada Inc.
  - .6 "Sheetrock Mold Tough Interior Panel" by CGC Inc
- 2.1.4 Steel Studs: ASTM C754
- 2.1.4.1 Minimum Base-Metal Thickness: 18 mils (0.0179" – 0.455 mm – 25 ga – Not Painted)
- 2.1.4.2 Depth: As indicated on Drawings.
- 2.1.5 Construction Air Handling Units: 3 stage filtration units (fiberglass pre-filter, pleated particulate pre-filter and HEPA filter) HEPA filtered portable air handling units "HEPA-AIRE® Portable Air Scrubbers" by Abatement Technologies; [www.abatement.com](http://www.abatement.com) or approved equivalent capable 99.97% efficiency at 0.3 microns. Size of construction air handling units to suit ventilation requirements.
- 2.1.6 Pressure Monitor: Wall-Mounted or portable differential Pressure Monitor " PPM3 Portable Differential Pressure Monitor" by Abatement Technologies; [www.abatement.com](http://www.abatement.com) or approved equivalent.

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- 2.1.7 Environmental Control Unit Technology: Mobile Containment unit "AIRE GUARDIAN®" by Abatement Technologies; [www.abatement.com](http://www.abatement.com) or approved equivalent.

## **PART 3 EXECUTION**

### **3.1 PERFORMANCE**

- 3.1.1 Compliance: comply with the requirements of CSA Z317.13, the Contract Documents and Owner's specific requirements including infection prevention and control, health and safety policies, work restrictions and any other special procedures.

### **3.2 PROCEDURES**

- 3.2.1 Execute work by methods that minimize dust generation from construction activities and minimize the chance of contamination of patient care areas and public spaces in the facility.
- 3.2.2 Use wet mops vacuum cleaners, drop sheets, water misting and other methods as necessary.
- 3.2.3 Infection Prevention and Control Barriers:
- 3.2.3.1 Provide temporary infection control dust barriers to prevent dust infiltration into adjacent areas during construction. Provide temporary infection control barriers where indicated on Drawings. Fully enclose work areas prior to any construction work.
  - 3.2.3.2 Seal all holes, penetrations, and openings in the construction barriers and walls which are part of the construction separation with appropriate materials. Sealed holes in fire rated separations must be equivalent in fire rating. Other holes must be sealed with tape and plastic, or similar materials which are of sufficient strength to withstand the pressure differential without leakage.
  - 3.2.3.3 Erect impermeable temporary infection prevention and control barriers from structure (including plenum above ceiling) to floor using temporary dust tight partitions in accordance CSA Z317.13 requirements. As a minimum construct as follows
    - .1 Preventative Measures I and II:
      - .1 Minimum 2 layers of 0.15 mm (6 mil) fire-retardant polyethylene or fire-retardant coated polyweave conforming to infection prevention and control requirements and reinforced with metal sub-frame. Continuously tape to provide perimeter seal.
      - .2 Minimum weight: 145 g/m<sup>2</sup> (4.3 oz per sq. yd).
    - .2 Preventative Measures III and IV: Provide construction separations that are fire resistive, and dust tight, constructed of gypsum board.

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- .1 Construction: 16 mm (5/8") thick gypsum board; 92 mm (3-5/8") deep metal studs space at 400 mm (16") o.c with mineral wool insulation; 16 mm thick (5/8") gypsum board.
      - .2 Finish: Paint public sides of partitions with minimum 2 coats of low VOC paint in accordance with requirements of Section 09 91 00. Colour: as selected by Consultant.
- 3.2.3.4 Ensure windows, doors, perimeter walls, plumbing penetrations, electrical outlets, intake and exhaust vents are properly sealed with plastic and taped.
- 3.2.3.5 Do not remove infection control barriers until the Work is complete and the area has been cleaned thoroughly and approved by Owner.
- 3.2.4 Anterooms:
  - 3.2.4.1 Construction anterooms where all clothing, tools, equipment, and other materials being removed are vacuumed using a HEPA-equipped vacuum prior to being taken off site through the hospital patient care areas.
  - 3.2.4.2 Construct anterooms in accordance with requirements of CSA Z317.13 and facility's infection prevention and control stipulations. As a minimum Provide the following:
    - .1 Minimum size: 3658 mm (12' - 0") long by 2440 mm (8' - 0") wide or as required to move construction materials in and out of construction area.
    - .2 Partitions: Infection Prevention and Control Barriers for Preventative measures III and IV as specified herein.
    - .3 Doors: Provide lockable doors equipped with door closers.
    - .4 Equip anterooms with temporary lighting and power.
    - .5 Provide HEPA vacuum in anteroom.
    - .6 Place tacky mat at entrance to and exit of anteroom.
  - 3.2.4.3 Keep anteroom as clean as patient care areas. Clean all cart wheels and run them over a tacky mat, or similar method to ensure no dust is tracked out via wheels.
  - 3.2.4.4 Ensure workers wear protective clothing which is removed before leaving the construction area. Ensure all workers exiting construction area vacuum down boots and clothing before entering facility. Ensure all workers walk across the tacky mats to clean their feet. Maintain tacky mats and ensure surface is kept tacky and replaced or have layers removed when they become dirty.
  - 3.2.4.5 When required, personnel working in the area shall either change clothing prior to leaving the construction site, or use shoe covers and cover clothing prior to leaving the area.

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- 3.2.4.6 Ensure ante-room is wet mopped frequently (several times a day in usual construction activity) or using similar methods as necessary to satisfy CSA Z317.13 and Owner's requirements.
- 3.2.5 Temporary Ventilation:
  - 3.2.5.1 Isolate HVAC systems to minimize route for dust movement. Disable ventilation system in work area until construction is complete. Unless specifically approved by Owner in writing do not use facility's HVAC system to maintain negative pressure in construction area.
  - 3.2.5.2 Cap and seal existing HVAC system openings (supply, return and exhaust) inside construction areas prior to starting work.
  - 3.2.5.3 Immediately seal new ducts added and installed with plastic sheeting (re-seal as required) to minimize entry of dust and/or contaminants into duct Work.
  - 3.2.5.4 Construction Air Handling Units:
    - .1 Provide temporary negative ventilation system within construction area with newly certified HEPA-filtered construction air handling units complete with 3 stage filtration (99.99% HEPA, 40% pre-filter, and 25 mm (1") thick fiberglass media pre-filter) before commencing work and throughout construction period. Replace filters as required to ensure proper operation. Replace fiberglass pre-filter daily.
    - .2 Each HEPA unit shall have a log book containing a completed schedule of filter changes, construction locations and certifications.
    - .3 Use HEPA-filtered construction air handling units to reduce airborne dust and to exhaust air from Project site in order to maintain a minimum 7.5 pa (0.16 psf) negative pressure differential between construction area and remainder of facility. Size units as required to maintain pressure.
    - .4 Direct exhaust discharge straight to exterior without any interruption, away from intake vents through a HEPA filter rated at 99.9% capable to capture particles down to 0.3 microns.
    - .5 Do not commence work until the required acceptable pressure levels are achieved and approved by Owner and Consultant.
  - 3.2.5.5 Monitoring:
    - .1 Provide an air pressure monitor located at least 5 m (16'-5") away from each construction area entrance with an alarm feature (audible and visual) and recording mechanism tied to Building Automation System calibrated to send notification when pressure differential drops below following levels:
      - .1 Less than 7.5 Pa (0.16 psf) for more than 4 hours collectively over a 24 hour period.

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- .2 Less than 2.5 Pa (0.05 psf) for more than 90 seconds collectively over a 24 hour period.
- .2 When air pressure in construction areas drops below acceptable standards or alarm sounds, stop all work and rectify cause of pressure drop. Do not resume work until satisfactory levels are achieved.

### **3.3 CLEANING AND PROTECTION**

- 3.3.1 Maintain construction areas clean and clear of debris during construction period. Remove debris at end of each Day. Erect external chute if construction is not taking place on ground floor level.
- 3.3.2 Vacuum work area with HEPA filtered vacuums daily or more frequently if needed. Vacuum air ducts and spaces above ceiling at completion of work and before installation of ceiling.
- 3.3.3 Vacuum interior of all walls with HEPA filtered vacuums before enclosing and installation of wall materials.
- 3.3.4 Remove construction debris using predetermined routing approved by Owner, in tightly closed containers, with solid lid, or plastic taped into place. Ensure debris removal containers are vacuumed or wet-wiped prior to removal from the construction area.
- 3.3.5 Clean HVAC system diffusers as closures are being removed, and operate system for 24 hours prior to final cleaning of construction area and removal of barriers (to the extent practical based on the system).
- 3.3.6 At the end of construction, thoroughly clean all horizontal surfaces using damp-wiping methods with disinfectant approved by Owner. Contact Owner to coordinate final cleaning of area by facility's housekeeping personnel.
- 3.3.7 After Owner has performed own cleaning and disinfection of construction area, remove temporary infection control dust barriers carefully in a manner that minimizes spread of dust and other particles associated with construction. Removal of barrier materials should be accompanied by vacuuming using HEPA filtered vacuum.

### **3.4 FIELD QUALITY CONTROL**

- 3.4.1 Inspections: Owner may perform periodic inspections of the Project site to monitor compliance with this Section, CSA Z317.13 or its own infection prevention and control requirements.

### **3.5 CLOSEOUT ACTIVITIES**

- 3.5.1 As the Work reaches completion, seal off area from general access with entry only for staff performing deficiency work. Anyone entering closed area shall sign log sheet and vacuum clean themselves using HEPA-filtered vacuum.

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- 3.5.2 Any work that is more than minor deficiency work in Consultant's opinion shall be reassessed for infection prevention and control risk to patients in accordance with CSA Z317.13. Appropriate preventative measures shall be put in place.
- 3.5.3 At the end of construction and after cleaning is complete maintain, barriers and HEPA-filtered construction air handling units running for minimum period indicated in CSA Z317.13.
- 3.5.4 Shut down, seal and remove construction air handling units using methods specified in CSA Z317.13.

**END OF SECTION**



## **1.1 REGULATORY REQUIREMENTS**

- 1.1.1 Building Code Information: Project has been designed and must be constructed in accordance with requirements of Ontario Building Code including any amendments (The Building Code or OBC”).
  - 1.1.1.1 Building Code Occupancy Classification: B2 .
- 1.1.2 Compliance with Laws: Contract Documents including Drawings, Specifications and other information for the Work are intended to comply with federal, provincial and municipal laws, by-laws, regulations and other requirements of authorities having jurisdiction. Perform Work in accordance with such requirements.
- 1.1.3 Specific design and performance requirements listed in specifications or indicated on Drawings may exceed minimum requirements established by referenced Building Code; these requirements will govern over the minimum requirements listed in Building Code.
- 1.1.4 Where OBC or Contract Documents do not cover a specific requirement, and provided there is no conflict with OBC, which is covered by the National Building Code of Canada, latest edition (or NBC), conform to relevant requirements of NBC including its related supplements. In case of conflict between OBC and NBC, the OBC shall govern within its jurisdiction. The application of NBC in this clause is intended to address unforeseen gaps in OBC and Contract Documents and shall be limited to aspects reasonably applicable to the project type and scope.

## **1.2 PERMITS, CERTIFICATES AND TRANSCRIPTS**

- 1.2.1 Required Documentation Prior to Commencement of the Work:
  - 1.2.1.1 Immediately after receiving notification of award of Contract, submit the following:
  - 1.2.1.2 Workplace Safety & Insurance Certificate status,
  - 1.2.1.3 transcription of insurances
  - 1.2.1.4 other certificates and transcripts required by Contract Documents, Consultant or authorities having jurisdiction.
- 1.2.2 Ensure permits, licenses and certificates included under specific Sections are provided as specified in those sections. Forward copies of permits to Owner and Consultant before commencing Work.
- 1.2.3 Building Permit Acquisition and Display: Contractor must display building permit and other relevant permits in visible location at Place of the Work.
- 1.2.4 Contractor's Responsibilities for Permits: Except for Building Permit, Contractor is responsible for applying for, obtaining, and covering fees for other necessary permits, licenses, certificates, inspections, and approvals mandated by Authorities Having Jurisdiction or Contract Documents.

## **1.3 ABBREVIATIONS AND ACRONYMS**

- 1.3.1 Commonly Assigned Meanings: Words and phrases in these Specifications or in other Contract Documents that are not expressly defined in the General Conditions or Supplementary Conditions of the Contract must be interpreted

based on their common meanings within the specific context in which they are used. When interpreting these terms, take into account specialized usage within various trades and professions relevant to the terminology. Contractor shall refer uncertainties to Consultant for clarification and direction.

#### **1.4 REFERENCE STANDARDS**

- 1.4.1 "Reference standards" means consensus standards, trade association standards, guides, and other publications expressly referenced in Contract Documents.
- 1.4.2 Where an edition or version date is not specified, referenced standards shall be deemed to be the latest edition or revision issued by the publisher at the time of bid closing. However if a particular edition or revision date of a specified standard is referenced in an applicable code or other regulatory requirement, the regulatory referenced edition or version shall apply. Changes to referenced standards after the bid closing date will be addressed as per the General Conditions of the Contract, particularly regarding changes in applicable laws and regulations if relevant.
- 1.4.3 Reference standards establish minimum requirements. If Contract Documents call for requirements that differ from a referenced standard, the more stringent requirements shall govern.
- 1.4.4 If compliance with two or more reference standards is specified and the standards establish different or conflicting requirements, comply with the most stringent requirement. Refer uncertainties to Consultant for clarification.
- 1.4.5 Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- 1.4.6 Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

END OF SECTION

**PART 1 GENERAL**

**1.1 STANDARDS PRODUCING INDUSTRY ORGANIZATIONS**

1.1.1 The following associations and organizations are cited in specification sections with acronym, name, and Internet URL addresses as follows:

1.1.2 Canadian Organizations:

<b>Abbreviation /Acronym</b>	<b>Name</b>	<b>Website</b>
ACEC	Association of Consulting Engineers of Canada	<a href="http://www.acec.ca">www.acec.ca</a>
AWMAC	Architectural Woodwork Manufacturers Association of Canada	<a href="http://www.awmac.com">www.awmac.com</a>
CaGBC	Canada Green Building Council	<a href="http://www.cagbc.org">www.cagbc.org</a>
CCA	Canadian Construction Association:	<a href="http://www.cca-acc.com">www.cca- acc.com</a>
CCDC	Canadian Construction Documents Committee,	<a href="http://www.CCDC.org">www.CCDC.org</a>
CFFM	Canadian Forces Fire Marshal	<a href="http://www.dnd.ca/admie/dgcps/CFFMe.htm">www.dnd.ca/admie/dgcps/CFFMe.htm</a>
CGA	Canadian Gas Association	<a href="http://www.cga.ca">www.cga.ca</a>
CGSB	Canadian General Standards Board	<a href="http://w3.pwgsc.gc.ca/cgsb">http://w3.pwgsc.gc.ca/cgsb</a>
CISC	Canadian Institute of Steel Construction	<a href="http://www.cisc-icca.ca">www.cisc-icca.ca</a>
CLA	Canadian Lumbermen's Association	<a href="http://www.cfa-international.org">www.cfa-international.org</a>
CNLA	Canadian Nursery Landscape Association	<a href="http://www.canadanursery.com">www.canadanursery.com</a>
CRCA	Canadian Roofing Contractors Association	<a href="http://www.roofingcanada.com">www.roofingcanada.com</a>
CSA	Canadian Standards Association International	<a href="http://www.csa-international.org">www.csa-international.org</a>
CSC	Construction Specifications Canada	<a href="http://www.csc-dcc.ca">www.csc-dcc.ca</a>
CSDMA	Canadian Steel Door Manufacturers Association	<a href="http://www.csdma.org">www.csdma.org</a>
CSPI	Corrugated Steel Pipe Institute	<a href="http://www.cspi.ca">www.cspi.ca</a>
CSSBI	Canadian Sheet Steel Building Institute	<a href="http://www.cssbi.ca">www.cssbi.ca</a>
CUFCA	Canadian Urethane Foam Contractor's Association	<a href="http://www.cufca.ca">www.cufca.ca</a>
CWC	Canadian Wood Council	<a href="http://www.cwc.ca">www.cwc.ca</a>
EC	Environment Canada	<a href="http://www.ec.gc.ca">www.ec.gc.ca</a>

<b>Abbreviation /Acronym</b>	<b>Name</b>	<b>Website</b>
EFC	Electro Federation of Canada	<a href="http://www.electrofed.com">www.electrofed.com</a>
MPI	The Master Painters Institute,	<a href="http://www.paintinfo.com">www.paintinfo.com</a>
NABA	National Air Barrier Association	<a href="http://www.naba.ca">www.naba.ca</a>
NLGA	National Lumber Grades Authority	<a href="http://www.nlga.org">www.nlga.org</a>
NRC	National Research Council	<a href="http://www.nrc.gc.ca">www.nrc.gc.ca</a>
QPL	Qualification Program List, c/o Canadian General Standards Board,	<a href="http://www.pwgsc.gc.ca/cg_sb">www.pwgsc.gc.ca/cg_sb</a>
RAIC	Royal Architectural Institute of Canada	<a href="http://www.raic.org">www.raic.org</a>
SCC	Standards Council of Canada	<a href="http://www.scc.ca">www.scc.ca</a>
TTMAC	Terrazzo, Tile and Marble Association of Canada	<a href="http://www.ttmac.com">www.ttmac.com</a>
ULC	Underwriters' Laboratories of Canada	<a href="http://www.ulc.ca">www.ulc.ca</a>

**1.1.3 USA Organizations:**

<b>Abbreviation /Acronym</b>	<b>Name</b>	<b>Website</b>
AA	Aluminum Association (The)	<a href="http://www.aluminum.org">www.aluminum.org</a>
AABC	Associated Air Balance Council	<a href="http://www.aabchq.com">www.aabchq.com</a>
AAMA	American Architectural Manufacturers Association	<a href="http://www.aamanet.org">www.aamanet.org</a>
AASHTO	American Association of Province Highway and Transportation Officials	<a href="http://www.transportation.org">www.transportation.org</a>
AATCC	American Association of Textile Chemists and Colorists	<a href="http://www.aatcc.org">www.aatcc.org</a>
ABAA	Air Barrier Association of America	<a href="http://www.airbarrier.org">www.airbarrier.org</a>
ABMA	American Bearing Manufacturers Association	<a href="http://www.abma-dc.org">www.abma-dc.org</a>
ACI	American Concrete Institute	<a href="http://www.concrete.org">www.concrete.org</a>
ACPA	American Concrete Pipe Association	<a href="http://www.concrete-pipe.org">www.concrete-pipe.org</a>
AEIC	Association of Edison Illuminating Companies, Inc. (The)	<a href="http://www.aeic.org">www.aeic.org</a>
AF&PA	American Forest & Paper Association	<a href="http://www.afandpa.org">www.afandpa.org</a>
AGA	American Gas Association	<a href="http://www.aga.org">www.aga.org</a>
AHAM	Association of Home Appliance Manufacturers	<a href="http://www.aham.org">www.aham.org</a>
AHRI	Air-Conditioning, Heating, and Refrigeration Institute, The	<a href="http://www.ahrinet.org">www.ahrinet.org</a>
AI	Asphalt Institute	<a href="http://www.asphaltinstitute.org">www.asphaltinstitute.org</a>
AIA	American Institute of Architects (The)	<a href="http://www.aia.org">www.aia.org</a>
AISC	American Institute of Steel Construction	<a href="http://www.aisc.org">www.aisc.org</a>

<b>Abbreviation /Acronym</b>	<b>Name</b>	<b>Website</b>
AISI	American Iron and Steel Institute	<a href="http://www.steel.org">www.steel.org</a>
AITC	American Institute of Timber Construction	<a href="http://www.aitc-glulam.org">www.aitc-glulam.org</a>
ALSC	American Lumber Standard Committee, Incorporated	<a href="http://www.alsc.org">www.alsc.org</a>
AMCA	Air Movement and Control Association International, Inc.	<a href="http://www.amca.org">www.amca.org</a>
ANSI	American National Standards Institute	<a href="http://www.ansi.org">www.ansi.org</a>
AOSA	Association of Official Seed Analysts, Inc.	<a href="http://www.aosaseed.com">www.aosaseed.com</a>
APA	APA - The Engineered Wood Association	<a href="http://www.apawood.org">www.apawood.org</a>
APA	Architectural Precast Association	<a href="http://www.archprecast.org">www.archprecast.org</a>
API	American Petroleum Institute	<a href="http://www.api.org">www.api.org</a>
ARI	Air-Conditioning & Refrigeration Institute	<a href="http://www.ari.org">www.ari.org</a>
ARMA	Asphalt Roofing Manufacturers Association	<a href="http://www.asphaltroofing.org">www.asphaltroofing.org</a>
ASCE	American Society of Civil Engineers	<a href="http://www.asce.org">www.asce.org</a>
ASCE/SEI	American Society of Civil Engineers/Structural Engineering Institute	(See ASCE)
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers	<a href="http://www.ashrae.org">www.ashrae.org</a>
ASME	ASME International (American Society of Mechanical Engineers International)	<a href="http://www.asme.org">www.asme.org</a>
ASSE	American Society of Sanitary Engineering	<a href="http://www.asse-plumbing.org">www.asse-plumbing.org</a>
ASTM	ASTM International (American Society for Testing and Materials International)	<a href="http://www.astm.org">www.astm.org</a>
ATIS	Alliance for Telecommunications Industry Solutions	<a href="http://www.atis.org">www.atis.org</a>
AWCI	Association of the Wall and Ceiling Industry	<a href="http://www.awci.org">www.awci.org</a>
AWCMA	American Window Covering Manufacturers Association (Now WCMA)	
AWI	Architectural Woodwork Institute	<a href="http://www.awinet.org">www.awinet.org</a>
AWPA	American Wood Protection Association (Formerly: American Wood Preservers' Association)	<a href="http://www.awpa.com">www.awpa.com</a>
AWS	American Welding Society	<a href="http://www.aws.org">www.aws.org</a>
AWWA	American Water Works Association	<a href="http://www.awwa.org">www.awwa.org</a>
BHMA	Builders Hardware Manufacturers Association	<a href="http://www.buildershardware.com">www.buildershardware.com</a>
BIA	Brick Industry Association (The)	<a href="http://www.bia.org">www.bia.org</a>
BICSI	BICSI, Inc.	<a href="http://www.bicsi.org">www.bicsi.org</a>
BIFMA	BIFMA International (Business and Institutional Furniture Manufacturer's Association)	<a href="http://www.bifma.com">www.bifma.com</a>

<b>Abbreviation /Acronym</b>	<b>Name</b>	<b>Website</b>
	International)	
BISSC	Baking Industry Sanitation Standards Committee	<a href="http://www.bissc.org">www.bissc.org</a>
CCC	Carpet Cushion Council	<a href="http://www.carpetcushion.org">www.carpetcushion.org</a>
CDA	Copper Development Association	<a href="http://www.copper.org">www.copper.org</a>
CEA	Consumer Electronics Association	<a href="http://www.ce.org">www.ce.org</a>
CFFA	Chemical Fabrics & Film Association, Inc.	<a href="http://www.chemicalfabricsandfilm.com">www.chemicalfabricsandfilm.com</a>
CGA	Compressed Gas Association	<a href="http://www.cganet.com">www.cganet.com</a>
CIMA	Cellulose Insulation Manufacturers Association	<a href="http://www.cellulose.org">www.cellulose.org</a>
CISCA	Ceilings & Interior Systems Construction Association	<a href="http://www.cisca.org">www.cisca.org</a>
CISPI	Cast Iron Soil Pipe Institute	<a href="http://www.cispi.org">www.cispi.org</a>
CLFMI	Chain Link Fence Manufacturers Institute	<a href="http://www.chainlinkinfo.org">www.chainlinkinfo.org</a>
CPA	Composite Panel Association	<a href="http://www.pbmdf.com">www.pbmdf.com</a>
CRI	Carpet and Rug Institute (The)	<a href="http://www.carpet-rug.com">www.carpet-rug.com</a>
CRRC	Cool Roof Rating Council	<a href="http://www.coolroofs.org">www.coolroofs.org</a>
CRRC	Cool Roof Rating Council	<a href="http://www.coolroofs.org">www.coolroofs.org</a>
CRSI	Concrete Reinforcing Steel Institute	<a href="http://www.crsi.org">www.crsi.org</a>
CSI	Construction Specifications Institute (The)	<a href="http://www.csinet.org">www.csinet.org</a>
CSSB	Cedar Shake & Shingle Bureau	<a href="http://www.cedarbureau.org">www.cedarbureau.org</a>
CTI	Cooling Technology Institute (Formerly: Cooling Tower Institute)	<a href="http://www.cti.org">www.cti.org</a>
DHI	Door and Hardware Institute	<a href="http://www.dhi.org">www.dhi.org</a>
ECA	Electrical Components Association	<a href="http://www.ec-central.org">www.ec-central.org</a>
EIA	Electronic Industries Alliance	<a href="http://www.eia.org">www.eia.org</a>
EIMA	EIFS Industry Members Association	<a href="http://www.eima.com">www.eima.com</a>
EJCDC	Engineers Joint Contract Documents Committee	<a href="http://content.asce.org/ejcdc/">http://content.asce.org/ejcdc/</a>
EJMA	Expansion Joint Manufacturers Association, Inc.	<a href="http://www.ejma.org">www.ejma.org</a>
ESD	ESD Association (Electrostatic Discharge Association)	<a href="http://www.esda.org">www.esda.org</a>
ETL SEMCO	Intertek ETL SEMCO (Formerly: ITS - Intertek Testing Service NA)	<a href="http://www.intertek-etlsemko.com">www.intertek-etlsemko.com</a>
FIBA	Federation Internationale de Basketball (The International Basketball Federation)	<a href="http://www.fiba.com">www.fiba.com</a>

<b>Abbreviation /Acronym</b>	<b>Name</b>	<b>Website</b>
FIVB	Federation Internationale de Volleyball (The International Volleyball Federation)	<a href="http://www.fivb.ch">www.fivb.ch</a>
FM Approvals	FM Approvals LLC	<a href="http://www.fmglobal.com">www.fmglobal.com</a>
FM Global	FM Global (Formerly: FMG - FM Global)	<a href="http://www.fmglobal.com">www.fmglobal.com</a>
FRSA	Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.	<a href="http://www.floridarroof.com">www.floridarroof.com</a>
FSA	Fluid Sealing Association	<a href="http://www.fluidsealing.com">www.fluidsealing.com</a>
FSC	Forest Stewardship Council	<a href="http://www.fsc.org">www.fsc.org</a>
GA	Gypsum Association	<a href="http://www.gypsum.org">www.gypsum.org</a>
GANA	Glass Association of North America	<a href="http://www.glasswebsite.com">www.glasswebsite.com</a>
GRI	(Part of GSI)	
GS	Green Seal	<a href="http://www.greenseal.org">www.greenseal.org</a>
GSI	Geosynthetic Institute	<a href="http://www.geosynthetic-institute.org">www.geosynthetic-institute.org</a>
HI	Hydronics Institute	<a href="http://www.gamanet.org">www.gamanet.org</a>
HI/GAMA	Hydronics Institute/Gas Appliance Manufacturers Association Division of Air-Conditioning, Heating, and Refrigeration Institute (AHRI)	<a href="http://www.ahrinet.org">www.ahrinet.org</a>
HMMA	Hollow Metal Manufacturers Association (Part of NAAMM)	
HPVA	Hardwood Plywood & Veneer Association	<a href="http://www.hpva.org">www.hpva.org</a>
HPW	H. P. White Laboratory, Inc.	<a href="http://www.hpwhite.com">www.hpwhite.com</a>
IAPSC	International Association of Professional Security Consultants	<a href="http://www.iapsc.org">www.iapsc.org</a>
ICBO	International Conference of Building Officials	<a href="http://www.iccsafe.org">www.iccsafe.org</a>
ICEA	Insulated Cable Engineers Association, Inc.	<a href="http://www.icea.net">www.icea.net</a>
ICPA	International Cast Polymer Association	<a href="http://www.icpa-hq.org">www.icpa-hq.org</a>
ICRI	International Concrete Repair Institute, Inc.	<a href="http://www.icri.org">www.icri.org</a>
IEC	International Electrotechnical Commission	<a href="http://www.iec.ch">www.iec.ch</a>
IEEE	Institute of Electrical and Electronics Engineers, Inc. (The)	<a href="http://www.ieee.org">www.ieee.org</a>
IES	Illuminating Engineering Society of North America	<a href="http://www.iesna.org">www.iesna.org</a>
IENT	Institute of Environmental Sciences and Technology	<a href="http://www.ient.org">www.ient.org</a>
IGMA	Insulating Glass Manufacturers Alliance	<a href="http://www.igmaonline.org">www.igmaonline.org</a>
ILI	Indiana Limestone Institute of America, Inc.	<a href="http://www.iliai.com">www.iliai.com</a>
ISA	Instrumentation, Systems, and Automation Society, The	<a href="http://www.isa.org">www.isa.org</a>
ISO	International Organization for Standardization	<a href="http://www.iso.ch">www.iso.ch</a>

<b>Abbreviation /Acronym</b>	<b>Name</b>	<b>Website</b>
ISSFA	International Solid Surface Fabricators Association	<a href="http://www.issfa.net">www.issfa.net</a>
ITS	Intertek Testing Service NA	(Now ETL SEMCO)
ITU	International Telecommunication Union	<a href="http://www.itu.int/home">www.itu.int/home</a>
KCMA	Kitchen Cabinet Manufacturers Association	<a href="http://www.kcma.org">www.kcma.org</a>
LGSEA	Light Gauge Steel Engineers Association	<a href="https://www.cfsei.org/">https://www.cfsei.org/</a>
LMA	Laminating Materials Association	(Now part of CPA)
LPI	Lightning Protection Institute	<a href="http://www.lightning.org">www.lightning.org</a>
MBMA	Metal Building Manufacturers Association	<a href="http://www.mbma.com">www.mbma.com</a>
MCA	Metal Construction Association	<a href="http://www.metalconstruction.org">www.metalconstruction.org</a>
MFMA	Maple Flooring Manufacturers Association, Inc.	<a href="http://www.maplefloor.org">www.maplefloor.org</a>
MFMA	Metal Framing Manufacturers Association, Inc.	<a href="http://www.metalframingmf.org">www.metalframingmf.org</a>
MH	Material Handling	(Now MHIA)
MHIA	Material Handling Industry of America	<a href="http://www.mhia.org">www.mhia.org</a>
MIA	Marble Institute of America	<a href="http://www.marble-institute.com">www.marble-institute.com</a>
MSS	Manufacturers Standardization Society of The Valve and Fittings Industry Inc.	<a href="http://www.mss-hq.com">www.mss-hq.com</a>
NAAMM	National Association of Architectural Metal Manufacturers	<a href="http://www.naamm.org">www.naamm.org</a>
NACE	NACE International (National Association of Corrosion Engineers International)	<a href="http://www.nace.org">www.nace.org</a>
NADCA	National Air Duct Cleaners Association	<a href="http://www.nadca.com">www.nadca.com</a>
NAGWS	National Association for Girls and Women in Sport	<a href="http://www.aahperd.org/nagws/">www.aahperd.org/nagws/</a>
NAIMA	North American Insulation Manufacturers Association	<a href="http://www.naima.org">www.naima.org</a>
NBGQA	National Building Granite Quarries Association, Inc.	<a href="http://www.nbgqa.com">www.nbgqa.com</a>
NCAA	National Collegiate Athletic Association (The)	<a href="http://www.ncaa.org">www.ncaa.org</a>
NCMA	National Concrete Masonry Association	<a href="http://www.ncma.org">www.ncma.org</a>
NCTA	National Cable & Telecommunications Association	<a href="http://www.ncta.com">www.ncta.com</a>
NEBB	National Environmental Balancing Bureau	<a href="http://www.nebb.org">www.nebb.org</a>
NECA	National Electrical Contractors Association	<a href="http://www.necanet.org">www.necanet.org</a>
NelMA	Northeastern Lumber Manufacturers' Association	<a href="http://www.nelma.org">www.nelma.org</a>
NEMA	National Electrical Manufacturers Association	<a href="http://www.nema.org">www.nema.org</a>
NETA	InterNational Electrical Testing Association	<a href="http://www.netaworld.org">www.netaworld.org</a>
NFHS	National Federation of Province High School	<a href="http://www.nfhs.org">www.nfhs.org</a>



<b>Abbreviation /Acronym</b>	<b>Name</b>	<b>Website</b>
	Associations	
NFPA	National Fire Protection Association	<a href="http://www.nfpa.org">www.nfpa.org</a>
NFRC	National Fenestration Rating Council	<a href="http://www.nfrc.org">www.nfrc.org</a>
NGA	National Glass Association	<a href="http://www.glass.org">www.glass.org</a>
NHLA	National Hardwood Lumber Association	<a href="http://www.natlhardwood.org">www.natlhardwood.org</a>
NOFMA	NOFMA: The Wood Flooring Manufacturers Association (Formerly: National Oak Flooring Manufacturers Association)	<a href="http://www.nofma.org">www.nofma.org</a>
NOMMA	National Ornamental & Miscellaneous Metals Association	<a href="http://www.nomma.org">www.nomma.org</a>
NRCA	National Roofing Contractors Association	<a href="http://www.nrca.net">www.nrca.net</a>
NRMCA	National Ready Mixed Concrete Association	<a href="http://www.nrmca.org">www.nrmca.org</a>
NSF	NSF International	<a href="http://www.nsf.org">www.nsf.org</a>
NSSGA	National Stone, Sand & Gravel Association	<a href="http://www.nssga.org">www.nssga.org</a>
NTMA	National Terrazzo & Mosaic Association, Inc. (The)	<a href="http://www.ntma.com">www.ntma.com</a>
NWFA	National Wood Flooring Association	<a href="http://www.nwfa.org">www.nwfa.org</a>
PCI	Precast/Prestressed Concrete Institute	<a href="http://www.pci.org">www.pci.org</a>
PDI	Plumbing & Drainage Institute	<a href="http://www.pdionline.org">www.pdionline.org</a>
PGI	PVC Geomembrane Institute	<a href="http://pgi-tp.cee.uiuc.edu">http://pgi-tp.cee.uiuc.edu</a>
PTI	Post-Tensioning Institute	<a href="http://www.post-tensioning.org">www.post-tensioning.org</a>
RCSC	Research Council on Structural Connections	<a href="http://www.boltcouncil.org">www.boltcouncil.org</a>
RFCI	Resilient Floor Covering Institute	<a href="http://www.rfci.com">www.rfci.com</a>
RIS	Redwood Inspection Service	<a href="http://www.redwoodinspection.com">www.redwoodinspection.com</a>
SAE	SAE International	<a href="http://www.sae.org">www.sae.org</a>
SCAQMD	South Coast Air Quality Management District	<a href="http://www.aqmd.com">www.aqmd.com</a>
SCTE	Society of Cable Telecommunications Engineers	<a href="http://www.scte.org">www.scte.org</a>
SDI	Steel Deck Institute	<a href="http://www.sdi.org">www.sdi.org</a>
SDI	Steel Door Institute	<a href="http://www.steeldoor.org">www.steeldoor.org</a>
SEFA	Scientific Equipment and Furniture Association	<a href="http://www.sefalabs.com">www.sefalabs.com</a>
SEI/ASCE	Structural Engineering Institute/American Society of Civil Engineers	(See ASCE)
SIA	Security Industry Association	<a href="http://www.siaonline.org">www.siaonline.org</a>
SJI	Steel Joist Institute	<a href="http://www.steeljoist.org">www.steeljoist.org</a>
SMA	Screen Manufacturers Association	<a href="http://www.smacentral.org">www.smacentral.org</a>

Abbreviation /Acronym	Name	Website
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association	<a href="http://www.smacna.org">www.smacna.org</a>
SMPTE	Society of Motion Picture and Television Engineers	<a href="http://www.smpte.org">www.smpte.org</a>
SPFA	Spray Polyurethane Foam Alliance (Formerly: SPI/SPFD - The Society of the Plastics Industry, Inc.; Spray Polyurethane Foam Division)	<a href="http://www.sprayfoam.org">www.sprayfoam.org</a>
SPIB	Southern Pine Inspection Bureau (The)	<a href="http://www.spib.org">www.spib.org</a>
SPRI	Single Ply Roofing Industry	<a href="http://www.spri.org">www.spri.org</a>
SSINA	Specialty Steel Industry of North America	<a href="http://www.ssina.com">www.ssina.com</a>
SSPC	SSPC: The Society for Protective Coatings	<a href="http://www.sspc.org">www.sspc.org</a>
STI	Steel Tank Institute	<a href="http://www.steeltank.com">www.steeltank.com</a>
SWI	Steel Window Institute	<a href="http://www.steelwindows.com">www.steelwindows.com</a>
SWPA	Submersible Wastewater Pump Association	<a href="http://www.swpa.org">www.swpa.org</a>
TCA	Tilt-Up Concrete Association	<a href="http://www.tilt-up.org">www.tilt-up.org</a>
TCNA	Tile Council of North America, Inc.	<a href="http://www.tileusa.com">www.tileusa.com</a>
TEMA	Tubular Exchanger Manufacturers Association	<a href="http://www.tema.org">www.tema.org</a>
TIA/EIA	Telecommunications Industry Association/Electronic Industries Alliance	<a href="http://www.tiaonline.org">www.tiaonline.org</a>
TMS	The Masonry Society	<a href="http://www.masonrysociety.org">www.masonrysociety.org</a>
TPI	Truss Plate Institute, Inc.	<a href="http://www.tpinst.org">www.tpinst.org</a>
TPI	Turfgrass Producers International	<a href="http://www.turfgrasssod.org">www.turfgrasssod.org</a>
TRI	Tile Roofing Institute	<a href="http://www.tilerroofing.org">www.tilerroofing.org</a>
UL	Underwriters Laboratories Inc.	<a href="http://www.ul.com">www.ul.com</a>
UNI	Uni-Bell PVC Pipe Association	<a href="http://www.uni-bell.org">www.uni-bell.org</a>
USAV	USA Volleyball	<a href="http://www.usavolleyball.org">www.usavolleyball.org</a>
USGBC	U.S. Green Building Council	<a href="http://www.usgbc.org">www.usgbc.org</a>
USITT	United States Institute for Theatre Technology, Inc.	<a href="http://www.usitt.org">www.usitt.org</a>
WASTEC	Waste Equipment Technology Association	<a href="http://www.wastec.org">www.wastec.org</a>
WCLIB	West Coast Lumber Inspection Bureau	<a href="http://www.wclib.org">www.wclib.org</a>
WCMA	Window Covering Manufacturers Association	<a href="http://www.wcmanet.org">www.wcmanet.org</a>
WDMA	Window & Door Manufacturers Association (Formerly: NWWDA - National Wood Window and Door Association)	<a href="http://www.wdma.com">www.wdma.com</a>
WI	Woodwork Institute (Formerly: WIC - Woodwork Institute of California)	<a href="http://www.wicnet.org">www.wicnet.org</a>

<b>Abbreviation /Acronym</b>	<b>Name</b>	<b>Website</b>
WMMPA	Wood Moulding & Millwork Producers Association	<a href="http://www.wmmpa.com">www.wmmpa.com</a>
WSRCA	Western States Roofing Contractors Association	<a href="http://www.wsrca.com">www.wsrca.com</a>
WWPA	Western Wood Products Association	<a href="http://www.wwpa.org">www.wwpa.org</a>

END OF SECTION

## **1.1 MINIMUM QUALIFICATION REQUIREMENTS**

- 1.1.1 Where Specifications use the term “experienced” in the context of qualifications, the following minimum criteria must be applied; individual Specification Sections may specify additional requirements.
- 1.1.2 Manufacturer Qualifications:
  - 1.1.2.1 Experience: Manufacturer must have a minimum of 10 years’ experience in producing systems similar to those specified for the Project.
  - 1.1.2.2 Capabilities: Manufacturer must demonstrate successful in-service performance and have adequate production capacity.
  - 1.1.2.3 Additional Requirements: Must meet qualification, warranty, and technical or factory-authorized service representative requirements.
- 1.1.3 Fabricator Qualifications:
  - 1.1.3.1 Experience: Fabricator must have at least 10 years’ experience in producing products similar to those indicated for the Project.
  - 1.1.3.2 Capabilities: Fabricator must have a record of successful in-service performance and sufficient production capacity.
- 1.1.4 Welder Qualifications:
  - 1.1.4.1 Certification: Welders must be certified per CSA W47.1 and CSA W59-M, with a minimum certification level of “Division 1” or “Division 2”.
  - 1.1.4.2 Operators: Must be qualified per CSA W47.1 for work specified in Contract Documents, with a minimum certification level of “Class O”.
  - 1.1.4.3 Inspectors and Supervisors: Must meet CSA W178.1 and CSA W178.2 qualifications and be certified by the Canadian Welding Bureau for “Category (a), Buildings”.
  - 1.1.4.4 Documentation: Submit copies of welding certificates to Consultant prior to Work commencement.
- 1.1.5 Installer Qualifications:
  - 1.1.5.1 Experience: Installer must have at least 5 years’ experience in installing systems similar to those specified for the Project and, where applicable, be certified by the manufacturer.
- 1.1.6 Professional Engineer Qualifications:
  - 1.1.6.1 Credentials: Must be a member in good standing of PEO and legally qualified to practice in the jurisdiction where the Project is located.
  - 1.1.6.2 Experience: Must have not less than 5 years’ experience in providing engineering services of similar scope.
  - 1.1.6.3 Insurance: Must carry professional liability insurance of not less than \$2,000,000.00. No exceptions.
  - 1.1.6.4 Restrictions: Engineers opting for “Mandatory Disclosure” or “Suggested Disclosure” approaches as permitted by PEO are not eligible to work on this Project.
- 1.1.7 Manufacturer’s Technical Representative Qualifications:

- 1.1.7.1 Credentials: Must be an authorized, trained, and manufacturer-approved representative to observe and inspect the installation of products similar to those specified for the Project.
- 1.1.8 Testing and Inspecting Agency Qualifications:
  - 1.1.8.1 Credentials: Must be an SCC-accredited laboratory or independent agency acceptable to Owner and Consultant with experience and capability to conduct testing and inspection indicated, as documented according to ASTM E329, and with additional qualifications specified in individual sections. Where required by authorities having jurisdiction, testing agency must be acceptable to such authorities.

## **1.2 CONTRACTOR'S QUALITY CONTROL**

- 1.2.1 Contractor's Quality Control: Quality Control is Contractor's responsibility. Use qualified personnel trained and experienced in managing and executing quality assurance and quality control procedures as required for the Project.
- 1.2.2 Contractor-Requested Testing: Testing and inspection requested by Contractor but not required by Contract Documents are Contractor's responsibility.
- 1.2.3 Manufacturer's Field Services: Engage factory-authorized service representatives for inspection and observation as specified in Contract Documents or required by manufacturer. Responsibilities include participation in preinstallation meetings, examination of conditions, verification of materials, observation of installation activities, and submission of written reports.
- 1.2.4 Removal and Replacement of Rejected Work: Promptly remove and replace defective Work rejected by Consultant. Promptly repair damage caused by removals or replacements.
- 1.2.5 Equipment and Systems: Refer to Divisions 21, 22, 23, and 26 for detailed requirements.

## **1.3 INDEPENDENT INSPECTION AND TESTING AGENCIES**

- 1.3.1 Owner's Direct Engagement of Agencies: The Owner will directly engage and compensate independent inspection and testing agencies to conduct inspections, tests, and quality control reviews on specific elements of the Work. The following inspection and testing services are specifically excluded from the Owner's direct engagement and remain the Contractor's full responsibility, to be included within the Contract Price:
  - 1.3.1.1 Inspection and testing mandated by laws, ordinances, rules, regulations, or orders of public authorities.
  - 1.3.1.2 Inspection and testing conducted solely for Contractor's convenience or own quality control.
  - 1.3.1.3 Testing, adjustment, and balancing of conveying systems, mechanical and electrical equipment and systems.
  - 1.3.1.4 Mill tests and certificates of compliance.
  - 1.3.1.5 Inspections and tests specifically designated as Contractor's responsibility in Divisions 02 – 49 of the Specifications.

- 1.3.2 Contractor's Responsibility: Employment of inspection and testing agencies by Owner does not relieve Contractor from responsibility to perform the Work in accordance with Contract Documents.
- 1.3.3 Cooperation with Inspection and Testing Agencies:
  - 1.3.3.1 Allow and arrange for inspection and testing agencies to have access to the Work, including access to off-site manufacturing and fabrication plants.
  - 1.3.3.2 Submit test samples required for testing in accordance with schedule of submittals specified in Section 01 32 00 – Construction Progress Documentation.
  - 1.3.3.3 Provide labour, Construction Equipment and temporary facilities to obtain and handle test samples on site.
  - 1.3.3.4 Notification for Required Inspection and Testing: For inspection and testing required by Contract Documents or by authorities having jurisdiction, provide Consultant and inspection and testing agencies with timely notification in advance of required inspection and testing.
- 1.3.4 Reporting:
  - 1.3.4.1 Contractor's Reporting Obligation: For inspection and testing required by Contract Documents or by regulatory requirements, and performed by Contractor retained inspection and testing agencies, submit to Consultant and Owner copies of reports. Submit within three Working Days after completion of inspection and testing.
  - 1.3.4.2 Owner's Reporting Requirements: For inspection and testing performed by Owner retained inspection and testing agencies, copies of inspection and testing agency reports will be provided to Contractor.
  - 1.3.4.3 Inspection and testing mandated by laws, ordinances, rules, regulations, or orders of public authorities.
  - 1.3.4.4 Inspection and testing performed solely for the Contractor's convenience or internal quality control processes.
  - 1.3.4.5 Testing, adjusting, and balancing of conveying systems, and mechanical and electrical equipment and systems.
  - 1.3.4.6 Mill tests and certificates of compliance for materials and equipment.
  - 1.3.4.7 Inspections and tests expressly designated as the Contractor's responsibility within Divisions 02 – 49 of the Specifications.

#### **1.4 REQUIRED INSPECTION AND TESTING**

- 1.4.1 Division 01, General Requirements:
  - 1.4.1.1 Integrated Systems Testing for Fire Protection and Life Safety Systems: Refer to Section 01 75 19
- 1.4.2 Division 03, Concrete:
  - 1.4.2.1 Concrete Material Testing:
    - .1 Slump Tests
    - .2 Air Content Tests
    - .3 Concrete Temperature Measurement

- .4 Compressive Strength Tests
      - .5 Mix Design Verification
    - 1.4.2.2 Reinforcement Inspection:
      - .1 Rebar Placement Inspection: Size, spacing, location, laps, and cover.
      - .2 Formwork Inspection: Alignment, stability, dimensions.
      - .3 Concrete Placement and Consolidation Observation.
      - .4 Curing Verification: Methods and duration.
    - 1.4.2.3 Refer to Structural Specifications for additional requirements.
  - 1.4.3 Division 05 – Metals:
    - 1.4.3.1 Structural Steel Fabrication Inspection:
      - .1 Material Verification: Mill certificates, grade verification.
      - .2 Welding Inspection.
      - .3 High-Strength Bolting Inspection.
    - 1.4.3.2 Structural Steel Erection Inspection:
      - .1 Member Placement and Alignment.
      - .2 Connection Verification.
      - .3 Field Bolting and Welding.
    - 1.4.3.3 Refer to Structural Specifications for additional requirements.
  - 1.4.4 Division 07, Thermal and Moisture Protection
    - 1.4.4.1 Sprayed Fire-Resistant Materials (SFRM):
      - .1 Thickness determination in accordance with ASTM E605.
      - .2 Density determination in accordance with ASTM E605.
      - .3 Cohesive and Adhesive Bond Strength in accordance with ASTM E736.
    - 1.4.4.2 Firestopping and Smoke Seals:
      - .1 Inspection of Penetration Firestop Systems in accordance with ASTM E2174.
      - .2 Inspection of Fire-Resistant Joint Systems in accordance with E2393.
  - 1.4.5 Division 09, Finishes
    - 1.4.5.1 Slab Moisture Testing: Refer to Section 01 74 00.
  - 1.4.6 Divisions 20 – 28: Refer to Mechanical and Electrical Specifications for required inspection and testing.

## **1.5 MOCK UPS**

- 1.5.1 General Requirements: Before starting Work specified in technical Specifications, prepare mock-ups for Consultant's review. Obtain Consultant's acceptance before proceeding with corresponding Work.

- 1.5.2 Size and Location: If mock-up location is not indicated in the Drawings or Specifications, locate where directed by Consultant on site.
- 1.5.3 Notification: Inform Consultant minimum 7 days prior to mock-up construction.
- 1.5.4 Supervision: For mock-up construction, use supervisory personnel and workers who will perform similar tasks on Project.
- 1.5.5 Aesthetic and Workmanship Range: Demonstrate intended aesthetic effects and quality.
- 1.5.6 Revisions and Review:
  - 1.5.6.1 Modify mock-up as required until Consultant acceptance is obtained. Address unsatisfactory conditions identified in preliminary review and modify mock-ups as necessary. Allow time in schedule for multiple reviews.
  - 1.5.6.2 Accepted mock-ups establish an acceptable standard for the Work.
  - 1.5.6.3 Acceptance of mock-ups does not imply acceptance of deviations from requirements of Contract Documents, unless such deviations are confirmed in writing by Consultant.
  - 1.5.6.4 Unless otherwise specified in the technical Specifications, accepted mock-ups forming part of the Work may remain as part of the Work.
- 1.5.7 Protection and Removal:
  - 1.5.7.1 Protect mock-ups from damage until the Work they represent is complete.
  - 1.5.7.2 Remove mock-ups only when the Work they represent is complete or when otherwise directed by Consultant.
- 1.5.8 Specific Requirements:
  - 1.5.8.1 In-Situ Mock-ups: Refer to Technical Specifications.
  - 1.5.8.2 Laboratory Mock-ups: Construct full-size assemblies at testing facility for performance verification.

END OF SECTION



## **PART 1      GENERAL**

### **1.1      RELATED DOCUMENTS**

- 1.1.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- 1.1.2 This Section shall be read in conjunction with the requirements outlined in the Owner Construction Procedures.

### **1.2      TEMPORARY UTILITIES, GENERALLY**

- 1.2.1 Provide temporary utilities as specified and as otherwise necessary to perform the Work. Minimize disruption to building occupants and operations.
- 1.2.2 Remove temporary utilities after use; ensure minimal disruption to building occupants and operations during removal.
- 1.2.3 Temporary utility connections, modifications, shutdowns, or impairments require prior coordination and approval through Owner. Unauthorized connections or shutdowns are strictly prohibited.

### **1.3      TEMPORARY ELECTRICAL POWER AND LIGHTING**

- 1.3.1 Connect to and use Owner's existing electrical supply for temporary use during construction. Usage at no cost to Contractor.
- 1.3.2 Refer to electrical specifications for existing maximum power supply available in existing building. Confirm available capacity and connection points with Owner before relying on existing supply.
- 1.3.3 Arrange and pay for necessary connections and disconnections of temporary power and lighting in accordance with regulatory requirements. Coordinate electrical work with Owner and ensure minimal disruption to building power and lighting systems.
- 1.3.4 Do not use newly installed permanent building power and lighting systems during construction unless specifically authorized by Owner in writing. If use is permitted, Contractor shall:
  - 1.3.4.1 Pay utility costs resulting from using permanent systems.
  - 1.3.4.2 Operate systems in a non-wasteful and energy efficient manner.
  - 1.3.4.3 Be responsible for any system damage.
  - 1.3.4.4 Coordinate operation schedules and settings with Owner to avoid conflicts with existing building operations.
  - 1.3.4.5 Just prior to Ready-for-Takeover , replace lamps which have been used for more than 3 months.
  - 1.3.4.6 Ensure that systems manufacturers' warranties do not commence until the date of Ready-for-Takeover or, if manufacturers' warranties do commence earlier when systems are put into use, arrange for necessary extension of manufacturers' warranties or provide equivalent coverage under Contractor's warranty. Obtain written confirmation from

manufacturers regarding warranty implications of using permanent systems during construction and provide such documentation to Owner.

#### **1.4 TEMPORARY WATER SUPPLY**

- 1.4.1 Connect to and use Owner's existing water supply for temporary use during construction, subject to existing available volume and pressure. Usage at no cost to Contractor.
- 1.4.2 Arrange and pay for necessary water supply connections and disconnections. Coordinate work with Owner to minimize disruption to occupants and building services.
- 1.4.3 If existing water supply is insufficient or unsuitable, arrange and pay for a supplementary temporary supply of water required during construction at no cost to Owner. Coordinate location and installation with Owner.

#### **1.5 TEMPORARY HEATING AND VENTILATION**

- 1.5.1 Arrange, provide, maintain, and pay for temporary heating and ventilation required during construction. Use flameless electric heaters or indirect-fired heaters vented safely to the outside. Direct-fired fuel-burning heaters (propane, kerosene) are not permitted inside hospital buildings.
- 1.5.2 Provide temporary heat for the Work as required to:
  - 1.5.2.1 Facilitate progress of Work.
  - 1.5.2.2 Protect the Work against dampness and cold.
  - 1.5.2.3 Prevent moisture condensation on surfaces, freezing, or other damage to finishes or stored Products.
  - 1.5.2.4 Maintain specified minimum ambient temperatures and humidity levels for storage, installation and curing of Products.
  - 1.5.2.5 After building is enclosed, maintain interior temperature of minimum 10 deg C in construction areas. Coordinate temperature settings with Owner to avoid conflicts with existing building systems and occupant comfort.
- 1.5.3 Provide temporary ventilation for the Work as required to:
  - 1.5.3.1 Prevent accumulations of fumes, exhaust, vapours, gases and other hazardous, noxious, or volatile substances in enclosed spaces, as required to maintain a safe work environment and to meet applicable regulatory requirements.
  - 1.5.3.2 Ensure that hazardous, noxious, or volatile substances do not migrate to Owner-occupied spaces. Implement measures to prevent cross-contamination of air systems between construction areas and occupied areas.
  - 1.5.3.3 Ensure that construction-generated dust, odours, fumes, and other contaminants do not migrate to Owner-occupied or patient care areas.
  - 1.5.3.4 Ventilate temporary sanitary facilities. Ensure ventilation from temporary sanitary facilities is directed away from occupied areas and does not cause odour issues for occupants.

- 1.5.4 Use of Permanent Systems: Do not use permanent building heating and ventilation (HVAC) systems for temporary heating or ventilation of construction areas unless authorized in writing by Owner. Using permanent systems to supply or exhaust air directly into or from the active construction zone is prohibited. If limited use (e.g., heating adjacent areas to maintain base temperatures) is permitted, Contractor shall comply with all conditions imposed by Owner and:
- 1.5.4.1 Pay utility costs resulting from using permanent systems.
  - 1.5.4.2 Operate systems in a non-wasteful and energy efficient manner.
  - 1.5.4.3 Be responsible for any system damage.
  - 1.5.4.4 Coordinate operation schedules and settings with Owner to avoid conflicts with existing building operations.
  - 1.5.4.5 Just prior to Ready-for-Takeover , replace filters, and perform required maintenance to ensure systems are in as near as new condition as possible.
- 1.5.5 Manufacturer Warranties (Permanent Systems): Ensure that systems manufacturers' warranties do not commence until the date of Ready-for-Takeover or, if manufacturers' warranties do commence earlier when systems are put into use, arrange for necessary extension of manufacturers' warranties or provide equivalent coverage under Contractor's warranty. Obtain written confirmation from manufacturers regarding warranty implications of using permanent systems during construction and provide such documentation to Owner.

END OF SECTION

## **PART 1      GENERAL**

### **1.1      RELATED DOCUMENTS**

- 1.1.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- 1.1.2 This Section shall be read in conjunction with the requirements outlined in the "Owner Construction Procedures".

### **1.2      CONSTRUCTION FACILITIES, GENERALLY**

- 1.2.1 Provide temporary construction facilities as necessary for the safe and efficient performance of the Work and in strict compliance with applicable regulatory requirements and the Sunnybrook Health Sciences Centre (SHSC) Procedures. Plan and locate facilities to minimize disruption to building occupants, hospital operations, patient care, and public access
- 1.2.2 Temporary facilities, including site offices (if permitted on site), storage areas, sanitation, and access routes, must be confined to areas approved by Owner as part of Site Logistics Plan and Separation Plan.
- 1.2.3 Maintain temporary construction facilities in good, safe, and clean condition, meeting hospital standards, for the duration of the Work. Ensure facilities do not negatively impact the occupied building environment (e.g., noise, odour, dust, appearance)
- 1.2.4 Remove temporary construction facilities, including associated services and debris, from the Place of the Work promptly when no longer required or upon project completion. Coordinate removal with Owner to minimize disruption and restore site to original condition or better.

### **1.3      CONSTRUCTION PARKING**

- 1.3.1 Parking at Place of the Work is limited and must be coordinated with Owner. Parking will be permitted at locations designed by Owner and agreed upon with Contractor, provided such parking does not disrupt continuing operation of building facility, building access, or occupant parking. Contractor must obtain written permits from Owner for on-site parking.
- 1.3.2 Contractor is responsible for informing its personnel of parking restrictions and for ensuring strict compliance. Violations may result in parking privileges being revoked.

### **1.4      BUILDING ACCESS**

- 1.4.1 Access Routes: Use only designated and Owner-approved routes for personnel and material movement to and from the work site, as detailed in the project-specific Separation Plan. Do not deviate from approved routes without prior authorization.
- 1.4.2 Coordination: Provide and maintain adequate, safe access to the Place of the Work. Coordinate all access routes, delivery schedules, and material movements

with Owner to minimize disruption to hospital operations, patient/visitor/staff traffic, emergency vehicle access, and Owner deliveries.

- 1.4.3 Assume full responsibility for, and repair at no cost to Owner, any damage caused by construction traffic or activities to existing roads, walkways, landscaping, or building infrastructure.
- 1.4.4 Implement effective measures (e.g., tire washing if required, site cleaning) to prevent tracking of mud, dust, or debris onto hospital property outside the immediate construction zone. Promptly clean up any mud tracking, material spillage, or debris resulting from construction traffic or operations.
- 1.4.5 Traffic Management:
  - 1.4.5.1 Ensure construction traffic adheres to hospital traffic regulations, speed limits, and designated routes.
  - 1.4.5.2 Schedule deliveries to minimize disruptions, avoiding peak hospital traffic hours where possible, and strictly adhere to loading dock protocols.
  - 1.4.5.3 Where required by the nature of the work, site conditions, or as directed by Owner, provide traffic control personnel (flag persons) and other necessary measures (e.g., barriers, signage) to manage construction traffic and ensure safe passage for hospital occupants, visitors, and Owner deliveries.

## **1.5 SITE OFFICES**

- 1.5.1 Use designated areas within project site for site-office and material staging, as discussed during coordination meetings. Coordinate layout and location of site office and staging area with Consultant prior to mobilization.

## **1.6 SANITARY FACILITIES**

- 1.6.1 Use of existing designated hospital washrooms may be permitted, subject to prior approval and designation by Owner.
- 1.6.2 If use of designated existing facilities is permitted, Contractor is responsible for maintaining these facilities in a clean and hygienic condition, acceptable to hospital standards, at all times. This includes daily cleaning by the Contractor, beyond regular hospital housekeeping services.
- 1.6.3 Repair immediately any damage caused by Contractor personnel to existing sanitary facilities at Contractor's expense.
- 1.6.4 Misuse of sanitary facilities or failure to maintain cleanliness shall constitute grounds for withdrawal of permission to use existing facilities and potential dismissal of offending personnel from site.
- 1.6.5 Do not use washrooms designated for patient, family, visitor, or general hospital staff use, unless explicitly designated for Contractor.
- 1.6.6 Do not use newly installed permanent washroom facilities during construction

## **1.7 ELEVATORS**

- 1.7.1 Use of existing hospital elevators by construction personnel or for material transport is strictly controlled and generally limited to after-hours. Refer to Section 01 14 00 for additional requirements.

## **1.8 FIRE PROTECTION**

- 1.8.1 Temporary Equipment: Provide and maintain appropriate temporary fire protection equipment, primarily portable fire extinguishers suitable for the construction hazards present, throughout construction area
  - 1.8.1.1 Use only Contractor-supplied extinguishers. Do not use Owner's fire extinguishers.
  - 1.8.1.2 Extinguishers shall have current inspection tags, be appropriately rated and maintained in accordance with NFPA10.
  - 1.8.1.3 Ensure personnel are trained in the use of provided extinguishers.
- 1.8.2 Perform work in a manner that does not compromise existing hospital fire protection systems (alarms, sprinklers, standpipes) unless an approved system bypass or impairment (Red Tag) is in effect. Refer to Section 01 14 00.
- 1.8.3 Maintain clear, unobstructed access to all existing fire exits, fire alarm pull stations, fire extinguishers, fire hose cabinets, and sprinkler heads/controls at all times, inside and outside the construction area. Do not block walkways, corridors, doors, or exits with materials or equipment.
- 1.8.4 Emergency Procedures: Ensure all personnel are familiar with site-specific fire emergency procedures, evacuation routes, and Owner's fire procedures.

END OF SECTION

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## **1.1 RELATED DOCUMENTS**

- 1.1.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- 1.1.2 This Section shall be read in conjunction with the requirements outlined in the "Owner Construction Procedures".
- 1.1.3 Comply with the latest version of CSA Standard Z317.13. Refer to Section 01 35 33 for additional information.

## **1.2 BARRIERS AND ENCLOSURES, GENERALLY**

- 1.2.1 Hoarding Plan: Develop and submit a detailed, project-specific Hoarding Plan as part of the Separation Plan and Site Specific Safety Plan for review and approval by Owner prior to commencing hoarding installation. Hoarding Plan shall detail location, type, construction methods, sealing details, signage, access points, negative pressure strategy, and compliance with CSA Z317.13 and Owner's Construction Procedures.
- 1.2.2 Hoarding must be fully installed, inspected, and approved by Owner before any construction activity commences within enclosed area.
- 1.2.3 Maintain temporary barriers and enclosures in good, safe, and structurally sound condition for the duration of the Work. Ensure barriers remain fully sealed and dust-tight at all perimeters (floor, ceiling, walls) and penetrations. Inspect regularly and repair breaches immediately.
- 1.2.4 Keep public-facing surfaces clean and free of dust, debris, graffiti, and damage.).
- 1.2.5 .3 Maintain required negative air pressure within the enclosure as specified and monitor as required. Refer to Section 01 35 33.
- 1.2.6 Do not remove temporary barriers and enclosures until all construction work within the area is complete and the multi-step cleaning and inspection process has been completed and authorized by Owner. Coordinate removal activities to minimize disruption.

## **1.3 INTERIOR HOARDING**

- 1.3.1 Construct hoarding barriers in accordance with approved Hoarding Plan, requirements determined by the IPAC Construction Preventative Measure Analysis and CSA Z317.13. Refer to Section 01 35 33.

## **1.4 WEATHER ENCLOSURES**

- 1.4.1 Provide weather tight enclosures to unfinished door and window openings, tops of shafts and other openings within the interior construction zone to prevent weather infiltration and to control dust and debris migration to occupied areas.
- 1.4.2 Provide weather enclosures to protect floor areas where walls are not finished and to enclose interior work areas that require temporary heating.

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- 1.4.3 Enclosures must be designed to be dust-tight and minimize noise transmission to occupied spaces.
- 1.4.4 Ensure weather enclosures do not obstruct building ventilation systems, fire exits, or sprinkler systems.

## **1.5 PROTECTION OF BUILDING FINISHES**

- 1.5.1 Provide robust temporary protection for existing and newly installed finishes, fixtures, equipment, and property (Owner's or otherwise) within and adjacent to the construction area, and along all approved access and transport routes.
- 1.5.2 Protection methods and materials (e.g., reinforced floor protection, corner guards, protective coverings for walls/doors/elevators) must be:
  - 1.5.2.1 Suitable for the type of finish being protected and the anticipated construction traffic/activity.
  - 1.5.2.2 Securely installed to prevent displacement.
  - 1.5.2.3 Maintained in good condition, replacing damaged sections promptly.
  - 1.5.2.4 Installed so as not to create trip hazards or impede required access or egress.
  - 1.5.2.5 Cleanable and compliant with IPAC requirements where located in or near patient care or public areas.
- 1.5.3 Coordinate protection plan and materials with Owner.

END OF SECTION



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## **PART 1      GENERAL**

### **1.1      GENERAL PRODUCT REQUIREMENTS**

- 1.1.1 Where Specification requirements include design of a Product or system and minimum material requirements are specified, design of such Product or system shall employ materials specified within applicable Section. Provide Products or systems meeting specified performance requirements and options. Model numbers may not reflect all options required.
- 1.1.2 When conflict occurs between specified technical description and manufacturer's standard model numbers and/or manufacturer's printed description of given model number, technical description specified in Contract Documents shall govern. Have manufacturers make necessary modifications in their manufacturing methods to meet requirements specified.
- 1.1.3 Where materials or components are not specified, Contractor shall augment materials with those of its choice within applicable Code limitations while maintaining integrity of design and architectural requirements.
- 1.1.4 Provide Products that are not damaged or defective, and suitable for purpose intended, subject to specified requirements. If requested by Consultant, furnish evidence as to type, source and quality of Products provided.
- 1.1.5 Defective Products, whenever identified prior to completion of the Work, will be rejected, regardless of previous reviews. Remove and replace defective and/or damaged Products at own expense and be responsible for delays and expenses caused by rejection.
- 1.1.6 Permanent manufacturer's markings, labels, trademarks, and nameplates on Products are not acceptable in prominent locations, except where required by regulatory requirements or for operating instructions, or when located in mechanical or electrical rooms.
- 1.1.7 Ensure products used for temporary facilities shall be sound in structural qualities.
- 1.1.8 Unless specified in the Contract Documents, ensure there is consistency in product and manufacturer for similar items, materials, equipment, or assemblies. Generally, endeavour to procure primary Products and materials forming part of the same Section from one source and from one manufacturer.
- 1.1.9 Ensure new materials used to repair damage are compatible with adjacent and existing work.

### **1.2      PRODUCT OPTIONS**

- 1.2.1 Where more than one brand or manufacturer is named in Specifications, or on Drawings, Contractor shall have choice to use one of specified manufacturer or brand provided requirements of Drawings and Specifications are met. Select product compatible with products previously selected. If Substitutions are

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considered, proceed in accordance with requirements of Section 01 25 00 – Substitution Procedures.

- 1.2.2 Products which are specified by their proprietary names, by part, or catalogue number form basis of the Contract. No Substitution for these is permitted without Consultant's acceptance in writing.
- 1.2.3 Materials, equipment, and fixtures specified form basis of Contract. Where more than one brand or manufacturer is mentioned in Specifications or on Drawings, Contractor may choose to use any of specified manufacturers or brands as long as they meet the requirements indicated in Drawings and Specifications.
- 1.2.4 Ensure materials, plant, equipment and fixtures are not damaged or defective and of quality specified and compatible for purpose intended. If requested Provide evidence as to type, source and quality. Remove and replace defective Products, at own expense, regardless of previous reviews, and be responsible for delays and expenses caused thereby. Replace factory finished equipment, or parts thereof, whose paint finish is damaged and cannot be reasonably remedied by paint touch-up.
- 1.2.5 Do not expose trademarks, labels and nameplates, including applied labels, in finished Work. Remove visible trademarks and labels except those which are giving operating instructions, which are essential to obtain identification of mechanical and electrical equipment for maintenance and replacement purposes and for mandatory fire ratings.
- 1.2.6 In general Owner retains right to select all choices available within specified Products colours, finishes and other options unless specified otherwise.

### **1.3 PRODUCT AVAILABILITY**

- 1.3.1 Immediately upon signing Contract, review Product delivery requirements and anticipate any potential Supply delays for any items. In case of anticipated delays in Supply of Products, unavailability of Products, or if a specified manufacturer is no longer in business, inform Consultant promptly. Consultant will authorize Substitutions or other remedial actions in a timely manner to prevent delays in performance of the Work.
- 1.3.2 If Consultant is not notified at the commencement of the Work regarding supply issues and it subsequently becomes clear that Work may be delayed for such reasons, Consultant reserves the right to substitute more readily available Products of similar character at no increase in Contract Price.
- 1.3.3 No substitution of materials will be allowed on basis of long deliveries.

### **1.4 PRODUCT INGREDIENT DISCLOSURE AND ENVIRONMENTAL TRANSPARENCY**

- 1.4.1 Environmental Product Declarations (EPD): When available, submit Product-specific Type III EPD or industry-wide (generic) EPD conforming to ISO 14025 or other recognized environmental product declaration framework.
- 1.4.2 Material Ingredient Reporting: When available, submit documentation demonstrating chemical inventory of materials to at least 0.1% (1000ppm) and conforming to one of the following:

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- 1.4.2.1 Health Product Declaration open Standard,
- 1.4.2.2 Cradle to Cradle v2 Basic level or Cradle to Cradle v3 Bronze level,
- 1.4.2.3 International Living Future Institute Declare
- 1.4.2.4 Other approved framework.
- 1.4.3 When multiple Products are specified, give preference to Products with compliant documentation.

## **1.5 PRODUCT DELIVERY, HANDLING AND STORAGE**

- 1.5.1 Package, crate, and brace Products to prevent damage during delivery, storage, and handling.
- 1.5.2 Provide protection to existing surfaces, finished surfaces, and work of others to prevent damage during delivery, storage, and handling.
- 1.5.3 Store packaged materials in original, undamaged condition with manufacturers' labels and seals intact.
- 1.5.4 Handle and store materials in accordance with manufacturers' and Suppliers' recommendations, in protected locations.
- 1.5.5 Replace Products damaged during delivery to Place of the Work, storage, handling, and installation.
- 1.5.6 Store materials susceptible to environmental damage in weather-tight enclosures, raised clear of ground and protected from weather, dampness, and deterioration.
- 1.5.7 Store and mix paints in a single designated, heated, and ventilated room. Remove oily rags and other combustible debris from the place of the Work daily. Take every precaution necessary to prevent spontaneous combustion.
- 1.5.8 Conform to written procedures for safe handling, storage, and use of noxious and hazardous materials, including special precautions, safe clean-up, and disposal procedures.
- 1.5.9 Store sheet Products on flat, solid, supports and keep clear of ground. Slope to shed moisture.
- 1.5.10 Enforce and maintain fire prevention methods at the site in accordance with the authorities having jurisdiction. Follow proper safety precautions when employing and storing flammable and toxic materials. Do not permit accumulation of debris.
- 1.5.11 Do not store flammable and toxic materials inside the building. Take measures to prevent spontaneous combustion. Place clothes and other disposable materials that are a fire hazard in closed metal containers and remove them from the building on a daily basis.
- 1.5.12 Provide adequate ventilation where flammable and toxic materials are being applied. Use only spark-proof equipment during application and prohibit smoking and open flames during application.
- 1.5.13 Do not dispose of volatile fluid wastes in storm, sanitary sewers or open drainage courses.

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- 1.5.14 Do not store materials on the roof that could fall or blow off from the roof as a result of wind, causing damage to property and jeopardizing public safety.

## **1.6 MOULD CONTROL DURING PRODUCT STORAGE AND HANDLING**

- 1.6.1 Conform to GC 9.5.
- 1.6.2 Products, materials, and substances employed in the Work must be free of mould amplification. Do not bring building Products onto site containing toxic moulds. Ensure construction workers are not exposed to amplified moulds. Take every reasonable precaution in circumstances for protection of workers. Be familiar with and implement recommendations outlined in "Mould Guidelines for the Canadian Construction Industry - CCA 82, latest edition".
- 1.6.3 Exercise continuous quality control and enforce mould control requirements upon Subcontractors and establish proper Product storage and delivery sequence to protect Products from weather and other exposures conducive to mould growth.
- 1.6.4 Take special care while handling and storing materials, including, but not limited to, particleboard, plywood, cellulose-based materials, wallpaper, ceiling panels, gypsum board, and insulation.
- 1.6.5 Monitor humidity levels and Provide adequate ventilation in storage areas. Be watchful of moisture conditions in storage areas.
- 1.6.6 Do not use materials that have been damaged by exposure to moisture and/or showing signs of mould growth.
- 1.6.7 Products with visible or invisible signs of mould amplification, whether installed or not, will be considered defective and must be removed at Contractor's expense.
- 1.6.8 If Consultant or Owner suspects that mould amplification was caused by Contractor's behavior or actions, Owner reserves the right to retain a qualified and experienced bio-contamination investigator to determine source and impact of potential mould amplification on site in accordance with GC 9.5. Investigator will perform sampling, laboratory analysis, and other required assessment steps to determine cause of the mould amplification and submit results to Owner and Contractor for action.

## **1.7 INDOOR AIR QUALITY**

- 1.7.1 Select Products for use in the Work that affect indoor air quality as little as possible. Provide adequate ventilation during installation of finishing materials to avoid deleterious effects on indoor air quality. Specifically, select Products for installation within air-handling and distribution systems to minimize the introduction of pollutants into building's fresh air supply.
- 1.7.2 Choose odourless Products wherever possible. Where odourless Products are not available, provide additional ventilation during construction period to encourage off-gassing of materials to their minimum levels prior to occupancy of building. In existing facilities, coordinate installation of products with strong odours with Owner to ensure impact on building occupants is minimized.

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- 1.7.3 Products and materials incorporated in the Work must be as free as possible of VOCs and emissions. Products emitting benzene, mercury, lead, or other known toxic compounds are not permitted.
- 1.7.4 Adhesives, sealants, paints and coatings applied on site and used in the building's interior must be tested and determined compliant in accordance with California Department of Public Health (CDPH) Standard Method v1.2–2017, using the applicable exposure scenario.
- 1.7.5 In addition to emissions criteria specified above, adhesives, sealants, paints and coatings applied on site and used in the building's interior must meet VOC limits established by authorities having jurisdiction and following VOC content limits:
  - 1.7.5.1 Paints and Coatings:
    - .1 Flat Paints and Coatings: 50 g/L.
    - .2 Nonflat Paints and Coatings: 50 g/L.
    - .3 Dry-Fog Coatings: 150 g/L.
    - .4 Primers, Sealers, and Undercoaters: 100 g/L.
    - .5 Rust-Preventive Coatings: 100 g/L.
    - .6 Zinc-Rich Industrial Maintenance Primers: 100 g/L.
    - .7 Pretreatment Wash Primers: 420 g/L.
    - .8 Clear Wood Finishes, Varnishes: 275 g/L.
    - .9 Clear Wood Finishes, Lacquers: 275 g/L.
    - .10 Floor Coatings: 50 g/L.
    - .11 Shellacs, Clear: 730 g/L.
    - .12 Shellacs, Pigmented: 550 g/L.
    - .13 Stains: 100 g/L.
  - 1.7.5.2 Adhesives and Sealants:
    - .1 Wood Glues: 30 g/L.
    - .2 Metal-to-Metal Adhesives: 30 g/L.
    - .3 Adhesives for Porous Materials (Except Wood): 50 g/L.
    - .4 Subfloor Adhesives: 50 g/L.
    - .5 Plastic Foam Adhesives: 50 g/L.
    - .6 Carpet Adhesives: 50 g/L.
    - .7 Carpet Pad Adhesives: 50 g/L.
    - .8 VCT and Asphalt Tile Adhesives: 50 g/L.
    - .9 Cove Base Adhesives: 50 g/L.
    - .10 Gypsum Board and Panel Adhesives: 50 g/L.
    - .11 Rubber Floor Adhesives: 60 g/L.
    - .12 Ceramic Tile Adhesives: 65 g/L.
    - .13 Multipurpose Construction Adhesives: 70 g/L.

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- .14 Fiberglass Adhesives: 80 g/L.
  - .15 Contact Adhesive: 80 g/L.
  - .16 Structural Glazing Adhesives: 100 g/L.
  - .17 Wood Flooring Adhesive: 100 g/L.
  - .18 Structural Wood Member Adhesive: 140 g/L.
  - .19 Special-Purpose Contact Adhesive (Used to Bond Melamine-Covered Board, Metal, Unsupported Vinyl, Rubber, or Wood Veneer 1/16 Inch or Less in Thickness to Any Surface): 250 g/L.
  - .20 Top and Trim Adhesive: 250 g/L.
  - .21 Plastic Cement Welding Compounds: 250 g/L.
  - .22 ABS Welding Compounds: 325 g/L.
  - .23 CPVC Welding Compounds: 490 g/L.
  - .24 PVC Welding Compounds: 510 g/L.
  - .25 Adhesive Primer for Plastic: 550 g/L.
  - .26 Sheet-Applied Rubber Lining Adhesive: 850 g/L.
  - .27 Aerosol Adhesive, General-Purpose Mist Spray: 65 percent by weight.
  - .28 Aerosol Adhesive, General-Purpose Web Spray: 55 percent by weight.
  - .29 Special-Purpose Aerosol Adhesive (All Types): 70 percent by weight.
  - .30 Other Adhesives: 250 g/L.
  - .31 Architectural Sealants: 250 g/L.
  - .32 Sealant Primers for Nonporous Substrates: 250 g/L.
  - .33 Sealant Primers for Porous Substrates: 775 g/L.
  - .34 Modified Bituminous Sealant Primers: 500 g/L.
  - .35 Other Sealant Primers: 750 g/L.
- 1.7.6 Prioritize emission control for Products known to be high chemical emitters, long term emitters, or those expected to present emissions in high amounts, including office furniture, seating, built-in cabinetry, flooring, ceiling, thermal insulation, paints and coatings, wall coverings, ceiling systems, HVAC duct materials, fireproofing, structural adhesives and sealants, millwork, cove base molding, wall systems, underlayments, and shelving.
- 1.7.7 Notify Suppliers of such materials of emission control requirements and ensure compliance is obtained from manufacturers. Use only materials that emit the lowest possible levels of particles and chemical vapors as specified in this Section.

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- 1.7.8 Schedule sequence of installation of finishing materials to reduce harm to indoor air quality. Provide necessary ventilation during and after installation of 'wet' Products such as paints, sealants, adhesives and of 'packaged dry' Products.
- 1.7.9 Isolate substances producing hazardous emissions from circulating air. Locate outside air intakes away from potential sources of contamination.
- 1.7.10 Install HVAC system filtration media in accordance with Mechanical Specifications. Ensure that the filtration media efficiency meets the specified minimum requirements. If Mechanical Specifications do not specify minimum filtration media efficiency, use filters with Minimum Efficiency Reporting Value (MERV) of 13 or better. If system cannot accommodate MERV 13 due to functional requirements, use highest MERV rating possible acceptable for the system.
- 1.7.11 Take measures to prevent entry of dust into HVAC system throughout construction phase.
- 1.7.12 Consider using electrically powered equipment on-site in lieu of gas or propane powered equipment to reduce possibility of carbon monoxide sickness and odours of gas or propane spreading throughout building.
- 1.7.13 Cooperate with Consultant's monitoring and air sampling of various parts of the new facility during construction and in final months before opening. If necessary, provide additional ventilation in areas designated by the Consultant. During construction phases where materials with high VOCs or odours are used, monitor air quality of the building periodically and implement increased local ventilation measures, such as temporary air handling units, if required.

## **1.8 SHEET METAL AND WIRE GAUGE INTERPRETATION**

- 1.8.1 Unless otherwise indicated, base metal thicknesses on uncoated thicknesses in accordance with the following interpretation guidelines:
  - 1.8.1.1 Steel sheet: manufacturer's standard gauge (msg).
  - 1.8.1.2 Stainless steel sheet: "United States Standard Gauge (Revised)".
  - 1.8.1.3 Non-ferrous sheet metal: "Brown & Sharpe Gauge".
  - 1.8.1.4 Ferrous wire thickness: "US Steel Wire Gauge"
  - 1.8.1.5 Non-ferrous wire thickness: "American Wire Gauge".
  - 1.8.1.6 Cold-formed light weight steel framing members: CSA S136-07

## **1.9 FIRE-RESISTANT RATINGS AND FLAME-SPREAD TESTS**

- 1.9.1 Where material, component or assembly is required to be fire rated, fire-resistance ratings shall be determined on basis of results of tests conducted in conformance with applicable test standards (such as CAN/ULC-S101, CAN/ULC S104, CAN/ULC S102 or other test) by one of following testing agencies acceptable to authorities having jurisdiction:
  - 1.9.1.1 Underwriters' Laboratories of Canada (ULC); [www.ulc.ca](http://www.ulc.ca)
  - 1.9.1.2 Underwriters' Laboratories Inc. (UL); [www.ul.com](http://www.ul.com)
  - 1.9.1.3 National Research Council of Canada; [www.nrc.ca](http://www.nrc.ca)

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1.9.1.4 National Board of Fire Underwriters; [www.fireunderwriters.ca](http://www.fireunderwriters.ca)

1.9.1.5 Warnock Hersey -ITS; [www.intertek.com/services/](http://www.intertek.com/services/)

- 1.9.2 If only one testing agency is referred to, it is acceptable to use equivalent ratings determined or listed by one of aforementioned testing agencies, provided it is approved by authorities having jurisdiction. Obtain acceptance of proposed equivalent rating or test design in writing and submit approval of authorities having jurisdiction for review.

## **1.10 ANCHORS AND FASTENERS**

- 1.10.1 Supply appropriate anchors, fasteners, accessories, and adhesives required for fabrication and erection of the Work. Fastening devices or adhesives must be of appropriate type, used in sufficient quantity, and in such a manner as to provide positive, permanent fastening that will not shift, loosen, or fail during occupancy of building due to vibration or other causes resulting from normal use of building. Install anchors at spacing to provide required load/stress carrying capacity. Do not use wood plugs.
- 1.10.2 Unless specified otherwise, use exposed metal fastenings and accessories of same texture, colour, and finish as Product being fastened. Lay out fastenings neatly, evenly spaced, and aligned. Keep exposed fastenings to a minimum. Do not use fastenings which will cause spalling, cracking, or deformation or deterioration of the material to which, or adjacent to which, they are being fastened.
- 1.10.3 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Do not use fastenings or fastening methods that may cause spalling or cracking of the material to which the anchorage is made.
- 1.10.4 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service. Ensure bolts do not project more than one diameter beyond nuts.
- 1.10.5 Supply adequate instructions and templates and, if necessary, supervise installation where fastenings or accessories for any Section are required to be built into the work of other Sections. Do not use powder-actuated fastening without approval of Owner. Take stringent safety precautions when using powder-actuated fastenings. Use only low-velocity plunger-type devices.
- 1.10.6 Use adhesives specified or, if not specified, those recommended by manufacturers of materials involved, compatible with materials to be joined, and effective in forming a permanent joint of adequate strength. Use screws, nails, staples, and other similar, driven fasteners suitable for materials to be joined and to conditions under which they are installed and used. Ensure that, in finished work, fasteners are sized to take a durable hold under stress to be encountered without damage to, or weakening of, elements secured together, and fastenings will not corrode or cause staining of exposed surfaces.
- 1.10.7 Use adhesives specified or, if not specified, those recommended by manufacturers of materials involved. Ensure adhesives are compatible with



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materials to which they will be joined and will be effective in forming a permanent joint / bond of adequate strength.

- 1.10.8 Use only screws, nails, staples, and other similar driven fasteners, that are suitable for materials to be joined and conditions under which they will be installed and used. Ensure that in finished Work, fasteners are sized to take durable hold under stress without causing damage to, or weakening of, secured elements. Prevent fastenings from corroding or causing staining of exposed surfaces.
- 1.10.9 Braze, solder, and prepare base metals to form durable connections with adequate strength to resist stresses to be encountered without deformation of joined elements. Ensure clean joints using methods and materials that prevent staining, corrosion, discolouration, deformation or other damage to finished work.
- 1.10.10 Perform welding to CSA W59-M for steel and to CSA W59.2-M for aluminum, unless specified otherwise. Ensure welding is performed by companies with certified operatives conforming to CSA W47.1 or CSA W47.2-M.
- 1.10.11 Supply necessary accessory items and materials required for the completion of the work, such as brackets, cleats, connectors, sealants, lubricants, cleaners, protection, and similar items, whether specified or not, so work is complete and can perform as required.

#### **1.11 BUILT IN ITEMS**

- 1.11.1 Provide and coordinate location of chases, slots and reglets including frames, sleeves, inserts, anchors, fasteners and bolts, forms and templates.

#### **1.12 PATENTS**

- 1.12.1 Verify existence or exclusivity of patent licenses for Products prior to installation.

#### **1.13 CONCEALMENT OF SERVICES**

- 1.13.1 Conceal pipes, service lines and ducts in chases, behind furring or above ceilings, except where they are indicated as being exposed to view. Where no ceiling is provided, such items may be exposed, but must be neatly and logically arranged.

**END OF SECTION**

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**PART 1      GENERAL**

**1.1            EXISTING CONDITIONS**

- 1.1.1 The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
- 1.1.2 Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, gas service piping, and water-service piping; underground electrical services; and other utilities.
- 1.1.3 Supply location data for work related to Project that must be performed by public utilities serving Project site.

**1.2            EXAMINATION AND ACCEPTANCE OF CONDITIONS**

- 1.2.1 Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
- 1.2.2 Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
- 1.2.3 Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
- 1.2.4 Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

**1.3            PREPARATION**

- 1.3.1 Existing Utility Information: Supply information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- 1.3.2 Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- 1.3.3 Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- 1.3.4 Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Consultant in accordance with requirements in Section 01 31 00.

**1.4 CONSTRUCTION LAYOUT**

- 1.4.1 Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks and existing conditions. If discrepancies are discovered, notify Consultant promptly.

**1.5 EXISTING SERVICES**

- 1.5.1 Before commencing work, establish location and extent of service lines in area of Work and notify Consultant of findings.

**1.6 CONCEALED ONDITIONS**

- 1.6.1 Promptly notify Consultant in writing if subsurface conditions at Place of Work differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.
- 1.6.2 After prompt investigation, should Consultant determine that conditions do differ materially, instructions will be issued for changes in Work in accordance with Section 01 26 00 - Contract Modification Procedures.

**END OF SECTION**

## **PART 1      GENERAL**

### **1.1          SUMMARY**

- 1.1.1 Except where otherwise specified in technical Specifications or otherwise indicated on Drawings, comply with requirements of this Section.

### **1.2          MANUFACTURER'S INSTRUCTIONS**

- 1.2.1 Install, erect, or apply Products in strict accordance with manufacturer's instructions.
- 1.2.2 Notify Consultant, in writing, of conflicts between Contract Documents and manufacturer's instructions where, in Contractor's opinion, conformance with Contract Documents instead of the manufacturer's instructions may be detrimental to the Work or may jeopardize the manufacturer's warranty.
- 1.2.3 Do not rely on labels or enclosures provided with Products. Obtain written instructions directly from manufacturers.
- 1.2.4 Provide manufacturer's representatives with access to the Work at all times. Render assistance and facilities for such access so that manufacturer's representatives may properly perform their responsibilities.

### **1.3          CONCEALMENT**

- 1.3.1 Conceal pipes, ducts, and wiring in floors, walls and ceilings in finished areas:
  - 1.3.1.1 after review by Consultant and authority having jurisdiction, and
  - 1.3.1.2 where locations differ from those shown on Drawings, after recording actual locations on as-built drawings.
- 1.3.2 Provide incidental furring or other enclosures as required.
- 1.3.3 Notify Consultant in writing of interferences before installation.

### **1.4          FASTENINGS - GENERAL**

- 1.4.1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials.
- 1.4.2 Prevent electrolytic action and corrosion between dissimilar metals and materials by using suitable non-metallic strips, washers, sleeves, or other permanent separators to avoid direct contact.
- 1.4.3 Use non-corrosive fasteners and anchors for securing in spaces where high humidity levels are anticipated.
- 1.4.4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage.
- 1.4.5 Keep exposed fastenings to a minimum, space evenly and install neatly.
- 1.4.6 Do not use fastenings or fastening methods that may cause spalling or cracking of material to which anchorage is made.

**1.5 FASTENINGS - EQUIPMENT**

- 1.5.1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.
- 1.5.2 Bolts shall not project more than one diameter beyond nuts.

**1.6 FIRE RATED ASSEMBLIES**

- 1.6.1 When penetrating fire rated walls, ceiling, or floor assemblies, completely seal voids with fire-stopping materials, smoke seals, or both, in full thickness of the construction element as required to maintain the integrity of the fire rated assembly.

**1.7 LOCATION OF FIXTURES, OUTLETS AND DEVICES**

- 1.7.1 Consider location of fixtures, outlets, and devices indicated on Drawings as approximate.
- 1.7.2 Locate fixtures, outlets, and devices to provide minimum interference, maximum usable space, and as required to meet safety, access, maintenance, acoustic, and regulatory, including barrier free, requirements.
- 1.7.3 Promptly notify Consultant in writing of conflicting installation requirements for fixtures, outlets, and devices. If requested, indicate proposed locations and obtain approval for actual locations.

**1.8 PROTECTION OF COMPLETED WORK AND WORK IN PROGRESS**

- 1.8.1 Adequately protect parts of the Work completed and in progress from any kind of damage.
- 1.8.2 Promptly remove, replace, clean, or repair, as directed by Consultant, work damaged as a result of inadequate protection.
- 1.8.3 Do not load or permit to be loaded any part of the Work with a weight or force that will endanger the safety or integrity of the Work.

**1.9 REMEDIAL WORK**

- 1.9.1 Notify Consultant of, and perform remedial work required to, repair or replace defective or unacceptable work. Ensure that properly qualified workers perform remedial work. Coordinate adjacent affected work as required.

**END OF SECTION**

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**PART 1      GENERAL**

**1.1            RELATED DOCUMENTS**

- 1.1.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2            REGULATORY REQUIREMENTS**

- 1.2.1 Comply with applicable regulatory requirements when disposing of waste materials.
- 1.2.2 Obtain permits from authorities having jurisdiction and pay disposal fees where required for disposal of waste materials and recyclables.

**1.3            GENERAL CLEANING REQUIREMENTS**

- 1.3.1 Provide adequate ventilation during use of volatile or noxious substances, ensuring no migration of fumes or odours to occupied areas.
- 1.3.2 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer, and which are acceptable for use in a healthcare environment.
- 1.3.3 Implement procedures to prevent cross-contamination during the cleaning process, particularly between construction areas and occupied or patient care areas. Ensure cleaning practices support Infection Prevention and Control (IPAC) requirements.
- 1.3.4 Ensure Contractor personnel are clean and appropriately dressed when transiting or using approved public areas outside the designated construction zone.
- 1.3.5 Notify the Consultant and Owner of the need for cleaning caused by Owner or other contractors.

**1.4            PROGRESSIVE CLEANING AND WASTE MANAGEMENT**

- 1.4.1 Housekeeping Plan: Contractor's Site Specific Safety Plan (SSSP) shall include a detailed Project Clean-Up Plan outlining procedures for maintaining site cleanliness and managing waste.
- 1.4.2 Maintain the Work area continuously in a tidy, clean, and safe condition, free from accumulation of waste materials, construction debris, and unnecessary storage.
- 1.4.3 Prevent accumulation of combustible materials. Remove garbage daily.
- 1.4.4 Provide appropriate, clearly marked containers for collection of waste materials and recyclables within the construction zone.
- 1.4.5 Remove waste materials and recyclables from immediate work areas, separate as required (e.g., hazardous, recyclable, general), and deposit in designated

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containers within the construction hoarding at end of each Working Day. Use secure, covered containers for transport of waste outside the immediate work area. Collect packaging materials for recycling or reuse.

- 1.4.6 Loading Dock Bin Removal: Remove waste containers/bins from the designated Owner's loading dock spot DAILY at designated times after hours, unless specific alternative arrangements are approved in writing by the Owner. Use only Contractor's own assigned bin; no sharing is permitted with Owner's bins.
- 1.4.7 Transport: Use only designated construction service elevator(s) for transporting waste. Refer to Section 01 14 00 for additional requirements. Do not use Owner's waste trucks or carts. Ensure cart/bin wheels are clean before transport outside hoarding. Protect floors along transport routes. Clean transport routes of any debris or track marks immediately. Contain heavy/bulk waste securely during transport
- 1.4.8 Clean interior building areas prior to start of finish work and maintain free of dust and other contaminants during finishing operations using methods that minimize airborne dust (e.g., HEPA vacuuming, damp wiping).
- 1.4.9 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly finished surfaces nor contaminate adjacent occupied areas or active building HVAC systems.
- 1.4.10 10 Clear snow and ice from designated construction access routes and adjacent public sidewalks as required to comply with applicable municipal regulatory requirements and maintain safe access.
- 1.4.11 Clean construction access routes, staging areas, and adjacent affected areas as required for Owner's continued safe use of site during construction.

## 1.5 FINAL CLEANING

- 1.5.1 Multi-Step Final Cleaning Process: Final cleaning and turnover shall follow the multi-step process defined in the Owner's Construction Procedures.

## 1.6 WASTE MANAGEMENT AND DISPOSAL

- 1.6.1 Dispose of **non-hazardous** waste materials and recyclables at appropriate, licensed municipal or private landfills and recycling facilities in accordance with applicable regulatory requirements.
- 1.6.2 Hazardous and Liquid Waste: Do not dispose of volatile or liquid waste such as mineral spirits, oil, fuels, paints, coatings, paint thinners, solvents, cleaners, adhesives, sealants, and similar materials together with dry waste materials, or dispose of them on the ground, in waterways, or down storm or sanitary sewers.
  - 1.6.2.1 Collect such waste materials in appropriate, compatible, labelled, covered containers.
  - 1.6.2.2 Handle, store, transport, and dispose of hazardous waste strictly in accordance with the Environmental Protection Act, Transportation of Dangerous Goods Act, and applicable regulations.

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- 1.6.2.3 Promptly remove hazardous waste from Place of the Work using licensed carriers and disposal facilities. Maintain disposal records/manifests and provide copies to Owner upon request.
- 1.6.2.4 Cover or wet down dry waste materials during handling and transport to prevent blowing dust and debris
- 1.6.2.5 Do not burn or bury waste materials at Place of the Work.

**END OF SECTION**



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## **PART 1      GENERAL**

### **1.1      GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.
- 1.1.2 Contractor is solely responsible for dividing the Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of the Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2      SUMMARY**

- 1.2.1 Purpose of Section: Section details integrated testing of fire protection and life safety systems in accordance with Ontario Building Code and CAN/ULC S1001 to verify performance and interconnectivity of integrated systems to ensure they function cohesively in emergency situations.
  - 1.2.1.1 Scope of Section is limited to testing of interconnections between life safety and/or fire protection systems as required by Ontario Building Code (OBC) Division B, Sentence 3.2.10.1. Refer to technical Specification Sections for individual testing and commissioning requirements for systems.
- 1.2.2 Related Requirements: Specifications throughout all Divisions of the Project shall be read as a whole, and may be directly applicable to this Section.

### **1.3      DEFINITIONS**

- 1.3.1 Commissioning: Owner-driven process ensuring that all building systems and components operate according to project requirements and construction documents.
- 1.3.2 Integrated Systems Testing: a code requirement specifically for fire protection and life safety systems to verify and document their interconnections and operational performance in accordance with design criteria.

### **1.4      REFERENCES**

- 1.4.1 Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply. Refer to 01 42 19 - Reference Standards.

### **1.5      PREINSTALLATION MEETINGS**

- 1.5.1 Project Meetings, generally: in accordance with Section 01 31 19, Project Meetings.

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- 1.5.2 Pre-installation Meetings: Schedule and hold a pre-installation meeting at the Project site at least one week before beginning work on this Section to coordinate activities with related Subcontractors.
  - 1.5.2.1 Required Attendance: Subcontractor performing work of this Section, representatives from manufacturers and fabricators involved in or affected by installation.
  - 1.5.2.2 Notification: Notify Consultant and Owner of scheduled meeting dates in advance; minimum 72 hour notice required.
  - 1.5.2.3 Agenda:
    - .1 Review progress of related construction activities and preparations for particular activity under consideration.
    - .2 Make note of required sequencing and coordination with materials and activities that have preceded or will follow.
  - 1.5.2.4 Reporting: Record significant discussions, agreements, and disagreements, including required corrective measures and actions.
  - 1.5.2.5 Distribution: Distribute minutes of the meeting to each party present and to other parties requiring information not more than 72 hours after meeting.

## **1.6 COORDINATION**

- 1.6.1 Collaborate with Subcontractors responsible for equipment or systems subject to testing under this Section, to ensure comprehensive testing and documentation of interface and integration between various fire protection and life safety systems provided under those divisions.

## **1.7 SUBMITTALS**

- 1.7.1 Submittals, generally: in accordance with Section 01 33 00, Submittal Procedures.
- 1.7.2 Proposed Integrated Testing Plan: Submit detailed test plan prepared by Integrated Testing Coordinator and complying with CAN/ULC S1001, highlighting testing protocols, schedules, and identifying involved parties. As a minimum, integrated testing plan must include:
  - 1.7.2.1 Functional objectives of system integrations
  - 1.7.2.2 Sequence of operations – normal and off-normal
  - 1.7.2.3 Test protocol and procedures
  - 1.7.2.4 Procedure for notifying building occupants.
  - 1.7.2.5 Alternative measures – notifications and safety protocols for ensuring occupant safety during testing.
  - 1.7.2.6 Phased occupancy requirements, where applicable.
  - 1.7.2.7 Where required, submit testing plan to Authorities Having Jurisdiction for review.

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1.7.3 Pre-Testing Confirmation: Submit confirmation from design professionals and installing contractors indicating that systems are installed correctly and functional.

1.7.3.1 Where required, sufficient notification to Authorities Having Jurisdiction to witness integrated systems testing.

## **1.8 CLOSEOUT SUBMITTALS**

1.8.1 Closeout Submittals, generally: in accordance with Section 01 78 00, Closeout Submittals.

1.8.2 Final Integrated Systems Testing Report:

1.8.2.1 Submit documentation providing results of implementation of integrated testing plan final in accordance with section 7 of CAN/ULC-S1001. Report must include:

- .1 Integrated testing plan,
- .2 Completed initial integration testing forms with test results,
- .3 Re-test integration testing forms, if necessary,
- .4 Pre-integration testing verification documentation for relevant systems.

1.8.2.2 Distribute copies of the final report as follows:

- .1 One copy to each relevant authority having jurisdiction,
- .2 One copy to Consultant,
- .3 One copy to Owner.

## **1.9 QUALITY ASSURANCE**

1.9.1 Integrated Testing Coordinator: Engage an entity with at least five years' experience installing, erecting, or assembling work similar in material, design, and extent to that indicated, and whose work has resulted in construction with a track record of successful in-service performance.

1.9.1.1 Integrated Testing Coordinator must be a knowledgeable and experienced individual, firm, corporation, or organization responsible for developing and implementing the integrated testing plan. Where a firm, corporation, or organization is responsible for integrated fire protection and life safety systems testing, a representative of that firm, corporation, or organization shall be designated as the integrated testing coordinator.

## **PART 2 PRODUCTS**

2.1.1 NOT USED

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## **PART 3      EXECUTION**

### **3.1      EXAMINATION**

- 3.1.1 Verify actual site conditions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.

### **3.2      PREPARATION OF INTEGRATED TESTING PLAN**

- 3.2.1 Develop integrated test plan as described in section 5 of CAN/ULC-S1001.
- 3.2.2 Collaborate with relevant Consultants to obtain necessary design performance criteria for integrating fire protection and life safety systems. This includes, but is not limited to :
  - 3.2.2.1 building floor plans,
  - 3.2.2.2 details of control sequences for different systems,
  - 3.2.2.3 mechanical and electrical riser diagrams, if relevant,
  - 3.2.2.4 operating and testing instructions from the trade contractors involved,
  - 3.2.2.5 alternative solutions to prescribed requirements of OBC or standards from the relevant Consultant.
- 3.2.3 Develop integrated testing plan to include, but not be limited to, following:
  - 3.2.3.1 Objectives for the functionality of system integrations,
  - 3.2.3.2 Operational sequence for the integrated elements of the fire protection and life safety systems, including:
    - .1 Normal operating conditions,
    - .2 Fire condition operations,
    - .3 Procedures for informing occupants about the testing of integrated systems,
  - 3.2.3.3 Safety management protocols, including safety guidelines and notifications, to ensure the safety of occupants and workers during system testing,
  - 3.2.3.4 For phased building testing, include additional procedures for:
    - .1 Testing each area of the building at different times for staged occupancy permits,
    - .2 Final testing of whole building once phased areas are complete, including scenarios where areas may be occupied concurrently.
  - 3.2.3.5 Append test procedures for each system-to-system integration as separate sections or as appendix.
  - 3.2.3.6 Provide workflow diagram in test plan to depict system dependencies, clearly showing sequence and relationships between different systems.

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- 3.2.3.7 Provide testing schedule with overall construction schedule, marking important dates for potential participation of parties in witnessing tests.
- 3.2.3.8 Present initial draft of test plan to Consultant(s) for review. Following feedback and necessary revisions, submit revised draft to Authority Having Jurisdiction.
- 3.2.3.9 In case of design changes in fire protection and life safety equipment or systems affecting integration, revise integrated test plan accordingly and submit for Consultant review before implementation.

### **3.3 TESTING PROCEDURES**

- 3.3.1 Develop test procedures and test forms in accordance with requirements of section 6 and section 7 of CAN/ULC-S1001 and as specified herein or in technical specifications.
- 3.3.2 Testing must include functional objectives of system integrations and sequence of operations under normal and off-normal conditions in accordance with CAN/ULC S1001.
- 3.3.3 Use simulations for tests for non-restorable systems or situations where actual testing could be hazardous.

### **3.4 EXECUTION**

- 3.4.1 Execute integrated testing program according to sections 6 and 7 of CAN/ULC-S1001.
- 3.4.2 Prior to starting tests, ensure necessary documentation for installation verification, acceptance testing, notifications, and required inspections by authorities of individual life safety equipment and systems are in place.
- 3.4.3 Notify relevant authorities having jurisdiction about testing schedule and invite them to participate or witness tests.
- 3.4.4 Employ temporary installation measures needed for testing. Maintain log detailing each temporary measure, its installation date, and specific integration test it is meant to support.
- 3.4.5 Planning Phase:
  - 3.4.5.1 Installing Subcontractors for each integrated system to submit documents detailing integration performance of systems.
  - 3.4.5.2 Identified deficiencies are to be documented and forwarded to respective installing Subcontractors for resolution.
- 3.4.6 Implementation Phase:
  - 3.4.6.1 Execute test protocol and procedures as established in planning phase.
  - 3.4.6.2 Ensure procedure for notifying building occupants is in place, considering alternative measures for occupant safety during testing.
  - 3.4.6.3 Consider phased occupancy plans and safety of personnel during testing, as applicable.

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3.4.7 Pre-Testing Requirements: Prior to actual integrated systems testing, complete following pre-testing steps:

- 3.4.7.1 Obtain written confirmation from installing Subcontractors that they acceptance testing and integrity of installation is confirmed.
- 3.4.7.2 Secure confirmation from installing contractors regarding correct installation of systems.
- 3.4.7.3 Establish and document occupant notification procedures.
- 3.4.7.4 Provide sufficient notification to authorities having jurisdiction to witness integrated systems testing, where required.

3.4.8 Sequence of Testing Events

- 3.4.8.1 Ensure sequence of testing events aligns with integrated testing plan developed during planning phase.
- 3.4.8.2 Start with functional testing of individual systems to ensure their independent operability.
- 3.4.8.3 Proceed to integrated system tests, where interoperation and collective response of systems to various scenarios is to be verified.
- 3.4.8.4 In event of test failure, initiate corrective measures and re-test affected systems until compliance is achieved.

### **3.5 ADJUSTING**

- 3.5.1 Restore systems to standard operational state after successful integrated testing. If temporary measures were used, remove such measures and update log to record removal date. Include log in final test report.

### **3.6 DEMONSTRATION AND TRAINING**

- 3.6.1 Train Owner's maintenance personnel to adjust, operate, and maintain life safety systems integration. Demonstration and training must include:
  - 3.6.1.1 Function of integration,
  - 3.6.1.2 Integration method – whether hardwired, network communication, or operating protocols,
  - 3.6.1.3 Type of information – data, commands, monitoring,
  - 3.6.1.4 Temporary measures for future retesting.

### **3.7 SCHEDULE OF INTEGRATED SYSTEMS TESTING**

- 3.7.1 Applicable portions of the Work subject to testing include, but are not limited to:
  - 3.7.1.1 Division 08 - Openings
    - .1 Electromagnetic Locking Devices
    - .2 Door hold-open devices
  - 3.7.1.2 Division 21 - Fire Suppression
    - .1 Sprinkler Systems
    - .2 Standpipe Systems

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- .3 Fire Pumps
- .4 Water Supply Control Valves
- .5 Freeze Protection Systems
- .6 Fixed Fire Suppression Systems
- .7 Cooking Equipment Fire Suppression Systems
- 3.7.1.3 Division 22 - Plumbing
  - .1 Water Supply
- 3.7.1.4 Division 23 - Heating, Ventilating, and Air Conditioning (HVAC)
  - .1 Smoke dampers,
  - .2 Motorized fire dampers,
  - .3 Smoke Control Pressurization Systems
  - .4 Smoke Control Smoke Exhaust Systems
  - .5 Freeze protection systems (for water-based fire protection piping)
- 3.7.1.5 Division 25 - Integrated Automation
  - .1 Building Automation System
- 3.7.1.6 Division 26 – Electrical
  - .1 Emergency power distribution systems.
  - .2 Emergency lighting control systems.
- 3.7.1.7 Division 28 - Electronic Safety and Security
  - .1 Fire Alarm System (including sequence of operation)
  - .2 Smoke alarm systems
  - .3 Security systems
  - .4 Notification systems,
  - .5 Hazardous protection monitoring

**END OF SECTION**

## **PART 1      GENERAL**

### **1.1      READY-FOR-TAKEOVER**

- 1.1.1 Prerequisites to attaining Ready-for-Takeover of the Work are described in the General Conditions of the Contract. Conform to GC 12.1.

### **1.2      INSPECTION AND REVIEW BEFORE READY-FOR-TAKEOVER**

- 1.2.1 Contractor's Inspection: Before applying for the Consultant's review to establish Ready-for-Takeover of the Work:
  - 1.2.1.1 Ensure that specified prerequisites to Ready-for-Takeover of the Work are completed.
  - 1.2.1.2 Conduct an inspection of Work with all Subcontractors to identify deficiencies and defects (deficiency list). Prepare comprehensive deficiency and defect list and repair or complete items to conform to Contract Documents.
  - 1.2.1.3 Review Contract Documents and inspect Work to confirm Work has been fulfilled and that Work is ready for inspection.
- 1.2.2 Consultant's Review: Upon receiving Contractor's request for review and accompanying deficiency list, Consultant and Contractor will mutually agree on date and time to inspect the Work. Consultant will notify Contractor of Work's readiness to attain Ready-for-Takeover and add any necessary items to deficiency list. Revised deficiency list must be provided to Consultant.
- 1.2.3 Maintain deficiency list and promptly correct any defective, deficient, or incomplete Work. Repeat Contractor's inspection and Consultant's review procedures specified above until Work is Ready-for-Takeover and there are no items remaining on the Contractor's deficiency list.
- 1.2.4 When Consultant determines that the Work is Ready-for-Takeover, Consultant will notify Contractor and the Owner in writing to that effect.

### **1.3      DEFECTS AND DEFICIENCIES**

- 1.3.1 Contractor must assume prime responsibility for ensuring that all items shown on Drawings and described in Specifications are complete. Neither Owner nor Consultant will issue deficiency lists.
- 1.3.2 Make Good any defects and deficiencies prior to the final inspection.
- 1.3.3 During inspections, a decision will be made regarding which elements must be completed at a later date due to uncontrollable circumstances such as weather, which defects must be rectified before building can be accepted, and which defects are to be treated as warranty items.
- 1.3.4 After rectification of deficiencies, notify Consultant in writing. Failure to provide such notification may result in withholding of final payment.



#### **1.4 PREREQUISITES TO FINAL PAYMENT**

- 1.4.1 Upon achieving Ready-for-Takeover of the Work, and prior to submitting a request for final payment in accordance with General Conditions of Contract, Contractor must:
- 1.4.1.1 Correct or complete any remaining defective, deficient, or incomplete work.
  - 1.4.1.2 Remove any remaining surplus Products, Construction Equipment, and Temporary Work from the Place of the Work.
  - 1.4.1.3 Perform final cleaning and waste removal as required due to the Contractor's work performed after Ready-for-Takeover, as specified in Section 01 74 00 – Cleaning and Waste Management.

#### **1.5 PARTIAL OWNER OCCUPANCY**

- 1.5.1 If partial Owner occupancy of a part of the Work is required before the date of Ready-for-Takeover of the entire Work of the Contract, the provisions of this Section shall apply, to the extent applicable, to that part of the Work that the Owner intends to occupy.

#### **1.6 SUBSTANTIAL PERFORMANCE OF THE WORK**

- 1.6.1 The prerequisites to, and steps for achieving Substantial Performance of the Work, or any similar milestone outlined in Payment Legislation applicable to the Place of the Work, must be separate from those for achieving Ready-for-Takeover of the Work, and must comply with Payment Legislation applicable to the Place of the Work (i.e. Construction Act).
- 1.6.2 Refer to Construction Act, latest edition and note the following definition which reads as follows:
- 1.6.2.1 "(1) For the purposes of this Act, a contract is substantially performed,
    - (a) when the improvement to be made under that contract or a substantial part thereof is ready for use or is being used for the purposes intended; and
    - (b) when the improvement to be made under that contract is capable of completion or, where there is a known defect, correction, at a cost of not more than,
      - (i) 3 percent of the first \$1,000,000 of the contract price,
      - (ii) 2 percent of the next \$1,000,000 of the contract price,
      - and
      - (iii) 1 percent of the balance of the contract price."
- 1.6.3 Comply with takeover procedures indicated in OAA/OGCA Document No. 100, except as modified by Contract Documents and generally as follows:
- 1.6.3.1 Stage 1 - Contract Submissions
    - .1 Contractor must submit all documentation required under the Contract.
  - 1.6.3.2 Stage 2 - Contractor's Inspection for Substantial Performance.

- .1 Arrange for inspection of the Work by inspection team, consisting of Contractor and/or their representative(s), prime mechanical and electrical Subcontractors and/or their representative(s), and other necessary Subcontractors and/or representative(s).
  - .2 After inspection, prepare list of incomplete and unsatisfactory work identified during inspection to be issued to all members of the inspection team and the Consultant and/or payment certifier.
- 1.6.3.3 Stage 3 - Contractor's Application for Certificate of Substantial Performance.
- .1 Upon confirmation that requirements for Substantial Performance have been met, submit written application to Consultant for certificate of Substantial Performance.
  - .2 Submit statement to Owner confirming that contract has been substantially performed and stating completion date for the balance of the Contract.
  - .3 Application must include:
    - .1 all closeout documentation required under Contract,
    - .2 statement of completion with cost values for work remaining to be completed, outstanding items and work which Owner and Contractor agree to be deferred at a later date.
  - .4 Invoice for basic holdback monies due for release, and a Statutory Declaration and WSIB Certificate of Clearance.
  - .5 Within 10 days of receiving application, Consultant will review and assess the work and notify Contractor of their determination within 7 days. If application is rejected, complete necessary work and submit subsequent application for Substantial Performance.
- 1.6.3.4 Stage 4 - Certificate of Substantial Performance.
- .1 If Consultant determines that Contract has been substantially performed, Consultant will issue certificate to Owner and Contractor using "ONTARIO FORM 9 - CERTIFICATE OF SUBSTANTIAL PERFORMANCE OF THE CONTRACT UNDER SECTION 32 OF THE ACT" within 7 days.
  - .2 Publish copy of certificate of Substantial Performance in a construction trade newspaper and provide Consultant with proof of the date of publication.
  - .3 Day following date of publication is date of commencement of 60-day period prior to release of the Basic Holdback monies.
- 1.6.3.5 Stage 5 - Certificate for Payment of Basic Statutory Holdback Monies.
- .1 Once Consultant receives required documentation, Consultant will promptly prepare Certificate for Payment of Basic Holdback Monies and issue to Owner with copy to Contractor, dated for payment one day after the expiry of the 60-day period for preservation of liens.

- .2 Consultant will advise Owner to verify that no liens have been preserved at the end of the 60-day period, notify Owner to review all forms of insurance to ensure adequate coverage for all parties, and that payment of Basic Holdback will be due and payable one day after expiry of 60-day period.
- .3 If required by General Conditions or Supplementary Conditions of Contract, Owner may be asked to place the basic holdback in separate bank account in joint names of Owner and the Contractor.

1.6.3.6 Stage 6 - Contractor's Completion of the Contract.

- .1 When Contractor is satisfied that Contract is completed as defined in Construction Act and after making inspections, Contractor must request a review and assessment of the Work from Consultant.
- .2 Include in request statement of amount of monies for Separate Holdback for Finishing Work due for release and payment upon expiry of the 60-day period from the date contract is completed.
- .3 Final review will include Consultant, necessary Subconsultants, Contractor, necessary Subcontractors and Owner, at their option.
- .4 Contractor will receive statement of completion within 7 calendar days of review and assessment, provided Consultant approves Contractor's application. Statement of completion will establish date of completion. If Consultant determines that Contract is not complete, Contractor will be notified in writing within 7 calendar days of review, and reasons for determination will be provided in writing.
- .5 If deficiencies remain, Consultant will provide list to Contractor, which must be corrected by a mutually agreed-upon date. Upon completion of deficiencies, Contractor must request further review and assessment by Consultant and the review and assessment will take place within 7 calendar days from the date of Contractor's request.

1.6.3.7 Stage 7 - Certificate for Payment of Monies for Finishing Holdback.

- .1 Upon receiving required closeout documentation and providing Consultant with statement of completion, Consultant will prepare Certificate for Payment of Monies Retained as Separate Holdback for Finishing Work, which will be dated one day after the expiry of the 60-day period which commences on the day following the date the contract is determined to have been completed.
- .2 Consultant will advise the Owner to verify that no liens have been preserved at the end the 60-day period, notify Owner that payment of monies for Separate Holdback for Finishing Work is due and payable one day after termination of the 60-day period, and issue certificate in amount requested in the Contractor's application for payment, and as approved by Consultant.

1.6.3.8 Stage 8 - Final Payment Certificate.

- .1 Upon Contractor's Completion of the Contract (Stage 6) and correction of deficiencies and uncompleted work, Consultant and/or payment certifier will issue final certificate for payment to the Owner, with copy to the Contractor, and final payment will be made to Contractor as stipulated in the certificate as provided in General Conditions and Supplementary Conditions of the Contract.

**1.6.3.9 Stage 9 - Warranty-Guarantee Period(s).**

- .1 Warranty-guarantee period shall begin on the date of Ready-for-Takeover, unless otherwise specified.

**1.7 WARRANTY-GUARANTEE PERIOD**

- 1.7.1 Owner will promptly provide written notice to Contractor and Consultant of defects during the one-year warranty-guarantee period. Consultant review of the Work will be conducted before the end of the warranty period.
- 1.7.2 At the start of the 12th month following Ready-for-Takeover, complete inspection of building and systems will be carried out by the Owner, Contractor, Consultant, and designated key Subcontractors to identify deficiencies to be rectified under warranty.

**END OF SECTION**

## **PART 1      GENERAL**

### **1.1      DEFINITIONS**

- 1.1.1 For the purposes of this Section, the following definitions as defined by the Ontario Association of Architects Practice Tip – PT.14 Version 1.1 apply:
- 1.1.1.1 As-built drawings: drawings usually prepared by Construction Manager as it constructs the project and upon which it documents the actual locations of building components and changes to the original contract documents. These, or a copy of same, are typically turned over to the Consultant or Owner at completion of the project.
  - 1.1.1.2 Record drawings: drawings usually prepared by the Consultant when contracted to do so. These are usually a composite of the original drawings, changes known to the Consultant and information taken from the Construction Manager's as-built drawings. Responsibility for preparation of record drawings may be delegated to Construction Manager if indicated as such in this Section.

### **1.2      OPERATION AND MAINTENANCE MANUAL**

- 1.2.1 Preparation: Prepare a comprehensive operation and maintenance manual, in the language(s) of the Contract, using personnel qualified and experienced for this task.
- 1.2.2 Submission Timing: Submit an initial draft of the operation and maintenance manual for Consultant's review. If required by Consultant's review comments, revise manual contents and resubmit for Consultant's review. If required, repeat this process until Consultant accepts the draft manual in writing.
- 1.2.3 Operation And Maintenance Manual Format:
- 1.2.3.1 Organize data in the form of an instructional manual.
  - 1.2.3.2 Hard Copies: Submit 3 hard copy set.
  - 1.2.3.3 Electronic Copies:
    - .1 Submission Media: Submit final version to Owner on electronic media acceptable to Owner CD-ROM, DVD-ROM and USB flash drive.. When permitted by Owner, digitally transfer files using a secure cloud storage system.
    - .2 Format: Provide electronic copy of Operation and Maintenance Manual in searchable PDF format.
      - .1 Use electronic files prepared by manufacturer where available. If scanning of paper documents is necessary, configure scanned file for minimum readable file size and ensure text is searchable (OCR).
      - .2 Bookmarking: Individual documents must be bookmarked based on file names. Name document files to correspond to system, subsystem, and equipment names used on table of contents.

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- .3 Group documents for each system and subsystem into bookmarked files.
    - 1.2.3.4 Shop Drawings: Provide electronic copy of reviewed Shop Drawings included in the manual as 1:1 scaled files in native format (e.g., .dwg, ) and PDF format.
      - .1 Submission Media: Submit final version to Owner on electronic media acceptable to Owner CD-ROM, DVD-ROM and USB flash drive. When permitted by Owner, digitally transfer files using a secure cloud storage system.
  - 1.2.4 Operation And Maintenance Manual Contents:
    - 1.2.4.1 General Contents:
      - .1 Table of contents for each volume.
      - .2 Introductory information including:
        - .1 Date of manual submission.
        - .2 Complete contact information for Consultant, subconsultants, other consultants, and Construction Manager, with names of responsible parties.
        - .3 Schedule of Products and systems indexed to content of volume.
      - .3 For each Product or system, include complete contact information for Subcontractors, Suppliers and manufacturers, including local sources for supplies and replacement parts.
      - .4 Product Data: mark each sheet to clearly identify specific products, options, and component parts, and data applicable to installation. Delete or strike out inapplicable information. Supplement with additional information as required.
      - .5 Reviewed Shop Drawings.
      - .6 Permits, certificates, letters of assurance and other relevant documents issued by or required by authorities having jurisdiction.
      - .7 Warranties.
      - .8 Operating and maintenance procedures, incorporating manufacturer's operating and maintenance instructions, in a logical sequence.
    - 1.2.4.2 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 trouble-shooting; 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 coordination 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 testing and balancing reports.
- .15 Include additional content as specified in technical Specifications sections.

1.2.4.3 Products And Finishes:

- .1 Include Product data, with catalogue number, options selected, size, composition, and colour and texture designations. Provide information for re-ordering custom manufactured Products.
- .2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .3 Include an outline of requirements for routine and special inspections and for regular maintenance to ensure that on-going performance of the building envelope will meet the initial building envelope criteria.
- .4 Include additional content as specified in technical Specifications sections.

1.2.4.4 Warranties:

- .1 Separate each warranty with index tab sheets keyed to Table of Contents listing.
- .2 List each warrantor with complete contact information.

- .3 Verify that documents are in proper form and contain full information. Ensure that warranties are for the correct duration and are in Owner's name.
- .4 Include maintenance bond(s), if any.

### **1.3 CONTRACTOR'S AS-BUILT DRAWINGS**

- 1.3.1 Submit final as-built drawings as specified in Section 01 32 00 – Construction Progress Documentation to Consultant.
  - 1.3.1.1 Hard Copies: Submit 3 hard copy set.
  - 1.3.1.2 Electronic Copies: Submit electronic copy of As-Built Drawings in PDF format on electronic media acceptable to Owner. When permitted by Owner, digitally transfer files using a secure cloud storage system.

### **1.4 PROJECT RECORD DRAWINGS**

- 1.4.1 Include cost of preparing record Drawings in Contract Price.
- 1.4.2 Consultant's Review: Consultant will review as-built Drawings to determine if general scope of changes, additional information recorded, and quality of drafting are generally acceptable.
- 1.4.3 Transfer of Information: After Consultant's review and acceptance, transfer information marked up on as-built drawings during progress of work to a master set of record drawing files as provided by Consultant. Incorporate Consultant's comments provided during Consultant's review of as-built drawings. Mark revised drawings as "RECORD DRAWINGS for <SHSC C2 Decant (K3E) and GIM Decant (K2E)>".
- 1.4.4 Format: Submit completed record drawings as follows:
  - 1.4.4.1 Hard Copies: Submit 3 printed sets of record drawings to Owner.
  - 1.4.4.2 Electronic Copies: Submit electronic copy of record drawings in PDF format on electronic media acceptable to Owner. When permitted by Owner, digitally transfer files using a secure cloud storage system.

### **1.5 SPARE PARTS, MAINTENANCE MATERIALS, AND SPECIAL TOOLS**

- 1.5.1 Supply spare parts, maintenance materials, and special tools in quantities specified in technical Specifications sections.
- 1.5.2 Ensure spare parts and maintenance materials are new, not damaged nor defective, and of same quality, manufacturer, and batch or production run as installed Products.
- 1.5.3 Provide tags for special tools identifying their function and associated Product.
- 1.5.4 Deliver to and store items at location directed by Owner at Place of the Work. Store in original packaging with manufacturer's labels intact and in a manner to prevent damage or deterioration.
- 1.5.5 Catalogue all items and submit to Consultant an inventory listing organized by Specifications section. Include Consultant reviewed inventory listing in operation and maintenance manual.



**SHSC C2 DECANT (K3E) AND GIM DECANT (K2E)**

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SECTION 01 78 00  
CLOSEOUT SUBMITTALS

END OF SECTION

## **1.1 SUMMARY**

- 1.1.1 Demonstrate and provide training to Owner's personnel on operation and maintenance of equipment and systems prior to scheduled date of Substantial Performance of the Work.
- 1.1.2 Owner will provide list of personnel to receive training and will coordinate their attendance at agreed upon times.
- 1.1.3 Coordinate and schedule demonstration and training provided by Subcontractors and Suppliers.

## **1.2 SUBMITTALS**

- 1.2.1 Submit proposed dates, times, durations, and locations for demonstration and training of each item of equipment and each system for which demonstration and training is required. Allow sufficient time for training and demonstration for each item of equipment or system, or time as may be specified in technical Specifications.
- 1.2.2 Consultant and Owner will review submittal and advise Contractor of any necessary revisions.
- 1.2.3 Submit report(s) within 5 working days after completion of demonstration and training:
  - 1.2.3.1 identifying time and date of each demonstration and training session,
  - 1.2.3.2 summarizing the demonstration and training performed, and
  - 1.2.3.3 including a list of attendees.
- 1.2.4 Submit video record of demonstration and training together with report.

## **1.3 PREREQUISITES TO DEMONSTRATION AND TRAINING**

- 1.3.1 Testing, adjusting, and balancing has been performed in accordance with Contract Documents.
- 1.3.2 Equipment and systems are fully operational.
- 1.3.3 Copy of completed operation and maintenance manual is available for use in demonstration and training.
- 1.3.4 Conditions for demonstration and training comply with requirements specified in technical Specifications.

## **1.4 DEMONSTRATION AND TRAINING**

- 1.4.1 Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, and maintenance of each item of equipment and system.
- 1.4.2 Review operation and maintenance manual in detail to explain all aspects of operation and maintenance.
- 1.4.3 Prepare and insert additional information in operation and maintenance manual if required.

END OF SECTION

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## **1.1 COMMISSIONING AGENCY**

- 1.1.1 Owner will retain and pay for an independent commissioning agency (CxA) to provide commissioning services for the Project.
- 1.1.2 For additional requirements, refer to individual technical specifications for each affected Division of the Work, specifically to sections 20 08 11, 20 08 15, and section 26 08 15.

## **1.2 INTEGRATED LIFE SAFETY SYSTEM TESTING**

- 1.2.1 CxA will be responsible for coordinating integrated life safety systems testing and act as the Integrated Testing Coordinator in accordance with CAN/ULC S1001. The Contractor shall cooperate with the CxA to permit the proper completion of integrated life safety systems testing.

## **1.3 ATTACHMENTS**

- 1.3.1 General Commissioning Plan:
  - 1.3.1.1 The Commissioning Plan (Cx Plan) for the Project will be provided by the Owner after Contract Award.

## **1.4 CONTRACTOR RESPONSIBILITIES**

- 1.4.1 The Contractor shall:
  - 1.4.1.1 Prepare each system ready for commissioning. Verify systems installation is complete and in operation.
  - 1.4.1.2 Coordinate commissioning with and assist commissioning agency.
  - 1.4.1.3 Perform and document verification, performance testing, adjusting, and balancing operations.
  - 1.4.1.4 Cooperate with commissioning agency and provide access to equipment and systems.
  - 1.4.1.5 Provide personnel and operate systems at designated times, and under conditions required for proper commissioning.
  - 1.4.1.6 Make instruments available to commissioning agency to facilitate spot checks during commissioning.
  - 1.4.1.7 Participate in commissioning meetings.
  - 1.4.1.8 Complete commissioning forms as requested by commissioning agency.
  - 1.4.1.9 Correct deficiencies identified in commissioning process.
  - 1.4.1.10 Incorporate commissioning data into operation and maintenance manual.
  - 1.4.1.11 Ensure that commissioning agency participates in demonstration and training as specified in Section 01 79 00 – Demonstration and Training.
  - 1.4.1.12 Provide instruments necessary for commissioning.

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## **1.5 COMMISSIONING AGENCY RESPONSIBILITIES**

1.5.1 The commissioning agency will:

- 1.5.1.1 Prepare a commissioning plan, including systems to be commissioned, forms, checklists and responsibilities of commissioning team members.
- 1.5.1.2 Implement the commissioning plan and lead the commissioning team through start-up, verification, performance testing, training, and document preparation.
- 1.5.1.3 Convene, chair, prepare and distribute minutes of commissioning meetings.
- 1.5.1.4 Supervise commissioning activities and witness inspections and tests.
- 1.5.1.5 Make periodic site visits for the purpose of selective checking of accuracy of commissioning form submissions, witness testing, and review of mock-ups.
- 1.5.1.6 Review content of operations and maintenance manual.

## **1.6 CONSULTANT RESPONSIBILITIES**

1.6.1 Consultant will:

- 1.6.1.1 Participate in commissioning meetings.
- 1.6.1.2 Coordinate commissioning agency's involvement in Shop Drawing review process.
- 1.6.1.3 Review verification and performance test results and direct Contractor to correct defects or deficiencies in the Work.
- 1.6.1.4 Initiate Change Orders or Change Directives identified as necessary by the commissioning process.
- 1.6.1.5 Review final commissioning report.

## **1.7 OWNER RESPONSIBILITIES**

1.7.1 Owner will:

- 1.7.1.1 Assign operations and maintenance personnel to participate in meetings, and witnessing of demonstration, and training.
- 1.7.1.2 Designate a person to acknowledge receipt of reports.

## **1.8 SCHEDULE OF EQUIPMENT AND SYSTEMS TO BE COMMISSIONED**

1.8.1 In general, the following equipment and systems will require commissioning:

- 1.8.1.1 HVAC Systems.
- 1.8.1.2 Building Automation Systems (BAS).
- 1.8.1.3 Electrical Systems.
- 1.8.1.4 Plumbing System.
- 1.8.1.5 Life Safety Systems (fire alarm, sprinklers etc.).

1.8.2 A definitive list of equipment and systems to be commissioned will be provided in the Cx Plan.

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SECTION 01 91 00  
GENERAL COMMISSIONING  
REQUIREMENTS

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END OF SECTION

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## **PART 1      GENERAL**

### **1.1      GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.
- 1.1.2 Contractor Responsibility: Contractor is solely responsible for dividing the Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of the Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2      SUMMARY**

- 1.2.1 Provide labour, materials, Products, equipment and services to complete the selective building demolition work as specified herein. This includes, but is not necessarily limited to, the following:
  - 1.2.1.1 Selective demolition to accommodate alterations.
  - 1.2.1.2 Alterations and repairs to existing partitions including fire-rated and non-fire-rated types.
  - 1.2.1.3 Alterations and repairs to existing ceilings, including gypsum board and acoustic ceiling tiles.
  - 1.2.1.4 Alterations and repairs to existing doors and frames.
  - 1.2.1.5 Alterations and repairs to existing flooring.
  - 1.2.1.6 Alterations and repairs to building structure as noted on Structural Drawings and Specifications.
  - 1.2.1.7 Salvaging items indicated on Drawings for reuse by Owner.
- 1.2.2 Not all items listed in this Section may be applicable to this project. Additional project-specific requirements can be found on Drawings, Schedules and other Specifications. Note that requirements outlined in this Section serve as minimum performance requirement for alterations and repairs work for this Project.

### **1.3      DEFINITIONS**

- 1.3.1 Cutting: Removal of in-place construction necessary to permit installation or performance of other Work.
- 1.3.2 Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.
- 1.3.3 Demolish: Completely remove and legally dispose of off-site.
- 1.3.4 Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

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- 1.3.5 Remove and Salvage: Detach items from existing construction and deliver them to Owner ready for reuse.
- 1.3.6 Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.
- 1.3.7 Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse. Include fasteners or brackets needed for reattachment elsewhere.
- 1.3.8 Recycle: Recovery of demolition waste for subsequent processing in preparation for reuse.
- 1.3.9 Existing to Remain: Existing functional items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

#### **1.4 ADMINISTRATIVE REQUIREMENTS**

- 1.4.1 Pre-demolition Meetings: Schedule and hold a mandatory pre-demolition meeting minimum 1 week before start of demolition work to coordinate activities with related Subcontractors.
  - 1.4.1.1 Notification: Where Consultant and Owner attendance is required; minimum 72 hour notice is required for scheduling and agenda distribution.
  - 1.4.1.2 Agenda: Include review of Demolition Plan, safety procedures, communication protocols, site access, utility coordination, and emergency procedures.
  - 1.4.1.3 Reporting: Record indicated minutes of the meeting, including all significant discussions, agreements, disagreements, assigned responsibilities, and required corrective measures and actions.
  - 1.4.1.4 Distribution: Distribute meeting minutes to each attendee and other relevant parties within 48 hours of the meeting.
- 1.4.2 Coordination:
  - 1.4.2.1 Plan and schedule alterations to accommodate anticipated difficulties, indicated on and inferable from the Contract Documents. Co-ordinate alterations with other Contractors and proceed with work expeditiously.
  - 1.4.2.2 Coordinate work between different Sections and trades, taking into account existing installations to ensure the best arrangement of pipes, conduits, ducts, and mechanical, electrical, and other equipment and items in available space. Under no circumstances will any extra payment be allowed due to failure by Contractor to take into consideration existing installations and to coordinate work.
  - 1.4.2.3 Coordinate alterations to minimize disruption to the Owner's ongoing operations. Minimize noise and interference with the use of existing premises and services, and ensure maximum safety for occupants during work.

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- 1.4.2.4 Schedule alterations required in Owner-occupied spaces or adjacent areas on a room-by-room basis, in accordance with a schedule mutually agreed upon with the Owner. Make requests for access to occupied areas in accordance with minimum notice periods specified in Division 01
- 1.4.2.5 Provide the Owner with appropriate notice in advance of unscheduled disturbance to use of existing premises and services. Perform work at times directed by the Owner. Make requests for shutdowns in accordance with minimum notice periods specified in in Division 01
- 1.4.2.6 Cutting, patching and making good existing work to accommodate new work and requirements specified under other Sections shall be done in conjunction with work specified herein.

## **1.5 SUBMITTALS**

- 1.5.1 Submittals, generally: in accordance with Section 01 33 00, Submittal Procedures.
- 1.5.2 Submit schedule for proposed shut-downs prior to start of Work. Notify Owner, in writing, of any planned utility outages in accordance with Owner's policies.
- 1.5.3 Submit schedule of noise-producing operations to Owner and wait for permission before proceeding.
- 1.5.4 Request for alterations, repairs, cutting, patching and remedial work:
  - 1.5.4.1 Submit written request before executing cutting, coring, or alteration work that may impact the structural integrity of any element of the Work; integrity of exterior elements; efficiency, maintenance, or safety of operational elements; visual qualities of exposed elements; work by Owner or other contractors; or warranty of installed Products.
  - 1.5.4.2 Request must be submitted in advance and include following:
    - .1 Identification of the Project.
    - .2 Location and description of the affected work, including drawings or sketches as necessary.
    - .3 Statement on necessity for cutting or alteration.
    - .4 Description of proposed work and the Products to be used.
    - .5 Alternatives to cutting and patching.
    - .6 Effect on the work of the Owner or other contractors.
    - .7 Written permission from any affected other contractors.
    - .8 Date and time work will be executed.
  - 1.5.4.3 Obtain proper permission and written permission from Owner, Consultant all parties affected before executing cutting, patching or alterations work.



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- 1.5.5 Request for alterations, repairs, cutting, patching and remedial work: Submit written request in advance of cutting, coring, or alteration which affects or is likely to affect:
  - 1.5.5.1 Structural integrity of any element of the Work.
  - 1.5.5.2 Integrity of weather exposed or moisture resistant elements.
  - 1.5.5.3 Efficiency, maintenance, or safety of any operational element.
  - 1.5.5.4 Visual qualities of sight exposed elements.
  - 1.5.5.5 Work of Owner or other contractors.
  - 1.5.5.6 Warranty of Products affected.
  - 1.5.5.7 Include the following in request:
    - .1 Identification of Project.
    - .2 Location and description of affected work, including drawings or sketches as required.
    - .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 other contractors.
    - .7 Written permission of affected other contractors.
    - .8 Date and time work will be executed.
- 1.5.6 Delegated Design Submittals:
  - 1.5.6.1 Engineering design completion of temporary structures used for demolition work is delegated to Contractor based on structural design criteria indicated in Contract Documents.
  - 1.5.6.2 Submit Shop Drawings for work of this Section that bear the stamp of a Professional Engineer registered in Province of Ontario.
  - 1.5.6.3 Submit copy of structural calculations upon request by Consultant.
- 1.5.7 Pre-Demolition Survey Report: Submit a pre-demolition survey report documenting existing conditions of adjacent structures, site features, and interior finishes that might be affected by demolition.
  - 1.5.7.1 Provide photographs or video recordings with date and time stamps, to establish baseline conditions before demolition commences.

## **1.6 QUALITY ASSURANCE**

- 1.6.1 Demolition Contractor Qualifications: Engage a demolition contractor with a minimum of 5 years of documented, verifiable experience in performing demolition work of similar scope, complexity, and scale, and with a consistently satisfactory safety record. Provide project references and safety records upon request.

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1.6.2 Professional Engineer Qualifications: Engage a Professional Engineer licensed to practice in the Province of Ontario to prepare, stamp, and certify the design of temporary support structures.

1.6.2.1 Professional Engineer must have a minimum of 5 years of specialized experience in structural engineering related to demolition, structural analysis of existing buildings, and design of temporary structures for demolition projects of similar complexity. Provide engineer's qualifications and project references upon request.

## **1.7 DELIVERY, STORAGE AND HANDLING**

1.7.1 Equipment and Materials: Deliver, store, and handle demolition equipment, materials, salvaged materials, and waste containers in a safe, secure, and environmentally responsible manner, in accordance with manufacturer's recommendations, applicable regulations. Protect materials from damage, deterioration, contamination, weather, theft, and vandalism.

1.7.2 Salvaged Material Storage: Store salvaged materials in designated areas as directed by Consultant. Storage areas shall be clearly marked, secure, protected from weather and damage, and readily accessible for inspection and removal.

## **1.8 FIELD CONDITIONS**

1.8.1 Environmental Restrictions:

1.8.1.1 Dust Control: Implement dust control measures continuously throughout demolition activities.

1.8.1.2 Noise Control: Implement noise control measures continuously throughout demolition activities to comply with building noise requirements and minimize disturbance to occupants.

1.8.1.3 Restrict noisy demolition activities to permitted hours as defined by building requirements.

1.8.2 Hazardous Materials Present: Hazardous materials are present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is appended to Section 00 31 00 for review and use. Examine report to become aware of locations where hazardous materials are present.

1.8.3 Temporary Protection for Adjacent Buildings: Provide temporary protection to adjacent areas to prevent damage from demolition debris, dust, noise, vibration, and accidental impacts. Protection measures shall be indicated in the Demolition Plan and maintained throughout demolition. Regularly inspect and maintain protection measures to ensure their effectiveness.

## **PART 2 PRODUCTS**

### **2.1 PERFORMANCE**

2.1.1 Comply with CSA S350, ANSI/ASSE A10.6, NFPA 241 and NBC Part 8.

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- 2.1.2 Comply with governing local notification regulations including Notice of Project filing before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- 2.1.3 Material Ownership: Unless otherwise indicated, demolition waste becomes property of Contractor.

## **2.2 MATERIALS**

- 2.2.1 Unless otherwise specified, when replacing existing or previously installed Products in the course of work, use replacement Products that match existing contiguous materials and finishes in all respects. Repairs and/or continuations of existing work must be relatively imperceptible in finished work when viewed under finished lighting conditions from a distance of 1.8 meters (6 ft).
- 2.2.2 Provide Products, materials, construction, workmanship, and finish matching in-place elements unless otherwise indicated. Where new materials must be supplied, use materials meeting minimum performance specified in technical Specifications (Div 02 to 49).
- 2.2.3 Ensure new materials used to repair damage are compatible with existing work. Verify compatibility and suitability of substrates, finishes, and primers before patching.
- 2.2.4 When materials are not specified in the Specifications, augment materials at Contractor's option, within Ontario Building Code limitations, while maintaining integrity of design and architectural criteria.
- 2.2.5 Unless otherwise indicated or specified, finish materials and appearance of new work must match existing contiguous materials and finishes in all respects. Repairs and/or continuations of existing work must be relatively imperceptible in finished work when viewed under finished lighting conditions from a distance of 1.8 meters (6 ft).
- 2.2.6 Defective Products will be rejected regardless of previous reviews. Remove and replace defective or damaged Products at own expense and be responsible for delays and expenses caused by rejection.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- 3.1.1 Before commencing work, carefully study and coordinate relevant Drawings, including Shop Drawings and manufacturers' literature, to obtain accurate information about locations, arrangements, and sizes of fixtures, equipment, ducts, piping, conduits, outlets, and similar items. Note that the Drawings are in part diagrammatic and intended to convey the general and approximate scope of alteration and repair work. Become familiar with conditions and spaces that may affect alterations and repairs work to ensure accurate execution of the work.
- 3.1.2 Obtain permission of Consultant before proceeding with demolition and/or alterations to any portion of existing building.

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### **3.2 EXISTING ACTIVITIES, FACILITIES AND CONDITIONS**

- 3.2.1 Arrange and pay for all costs for temporarily relocating, securing, or accommodating existing services that may affect the work. Notify Consultant immediately should any piping, sewers, cables, or similar services are encountered during the work that are not known from Owner's and utilities companies. Do not proceed with any removal or cutting until directed.
- 3.2.2 Protect and maintain existing services and systems in operation. Ensure all lines affected are safe, secure, and properly sealed when removing or altering existing services.
- 3.2.3 Prior to starting work in existing areas, provide a report listing any defects and deficiencies, with accompanying photographs if necessary, for work that will remain in the area or may be vulnerable to damage due to proximity to alteration work. Rectify any defects or deficiencies not recorded in report at own expense. Contractor and Consultant will initial report before work commences.
- 3.2.4 Provide necessary temporary connections and supports and provide necessary protections to ensure uninterrupted operation of all services and systems scheduled to remain in operation during the course of the work.
- 3.2.5 Where new connections are made to existing services, make connections as directed and locate connections so that services are not damaged or disturbed by construction activities. Make arrangements and pay all costs for necessary changes or additions to existing services, including insulation and sealing of exposed pipes and ducts.
- 3.2.6 Do not interfere with operation of existing services unless directed or approved in writing by Owner. Perform cutting, capping, re-routing and other related work on existing services in a manner that will not damage or interfere with operation of other services.
- 3.2.7 Verify existing services conditions and connections as required to ensure Work can be properly executed. Notify Owner and Consultant of any discrepancies or unsatisfactory conditions.
- 3.2.8 When working near or above existing services, provide suitable bridging or protective support. Protect the services with suitable barriers, coverings or shielding to prevent damage.
- 3.2.9 Where Work involves cutting, disconnecting or interrupting services, provide Owner and Consultant with advance notice and secure their permission prior to proceeding. Ensure that all affected services are reinstated, fully operational and tested to the satisfaction of Owner and Consultant.

### **3.3 PREPARATION**

- 3.3.1 Design and install shoring, bracing, and supports to maintain structural integrity of The Work.
- 3.3.2 Ensure adequate protection is provided for items adjacent to The Work and obtain Consultant's acceptance for protection provided.
- 3.3.3 Provide protection from weather throughout the entire construction period.

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- 3.3.4 Ensure proper and safe means of fire exit from all zones of existing building are provided at all times, to permission of Authorities Having Jurisdiction.
- 3.3.5 Erect weather tight and dustproof screens in accordance with requirements of CSA Z317.13 to provide isolation and protection from adjoining areas and rooms. Refer to Section 01 35 33 - Infection Prevention And Control Procedures for additional requirements.

### **3.4 REMOVAL OF EXISTING CONSTRUCTION**

- 3.4.1 Perform demolition and removal work in accordance with CSA S350.
- 3.4.2 Remove selected building components from locations indicated on Drawings and/or as directed by Owner. Remove carefully items designated to be re-used or to be handed over to Owner. Storage location may be in same building or at location away from the Place of The Work.
- 3.4.3 Do not stack or pile materials and/or debris in building to extent that it will create obstruction or hazards to building and occupants thereof.
- 3.4.4 Remove demolition material in covered container or double bags when construction area is in vicinity of areas and at time of day when there is minimal corridor traffic.
- 3.4.5 Do not locate demolition storage bin adjacent to air intake HVAC units;
- 3.4.6 At the end of each work session, leave selective demolition work in safe conditions.
- 3.4.7 Existing Flooring:
  - 3.4.7.1 Vacuum existing flooring thoroughly, prior to removal, using vacuum equipped with power head/sweeper.
  - 3.4.7.2 Apply fine mist water spray to flooring as required to minimize dust generation during removal. Avoid spraying near electrical outlets.
  - 3.4.7.3 Remove existing flooring from areas indicated and legally dispose materials off site.
  - 3.4.7.4 Vacuum substrate immediately after existing flooring has been removed.
  - 3.4.7.5 Remove existing flooring accessories and wall base from areas to receive new flooring materials.
  - 3.4.7.6 Remove loose and poorly adhered adhesive remaining on substrate. Remove trowel tracks and rough remaining adhesive using mechanical means.
- 3.4.8 Services:
  - 3.4.8.1 Where permanently disconnecting domestic water, medical vacuum, medical gas, natural gas, treated water, drainage, vent, or other piping serving removed fixtures, inlets, outlets or equipment, remove all associated piping back to remaining active mains.
  - 3.4.8.2 Cut off, cap, divert or remove existing services in areas being altered which are affected by changes as required or as directed by municipal

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authorities and utility company concerned and Consultant. Protect and maintain active services to existing building.

3.4.8.3 Protect active services which are intended to remain and which pass through spaces involved in alterations and repairs.

3.4.8.4 Refer to Drawings for removal, capping, and alterations to conduit, wiring, fixtures, ducts, piping and other service lines.

3.4.9 Floor Drains:

3.4.9.1 Isolate and seal off existing floor drains that will not be in use after completion of Project from the building's active drainage and vent system. Ensure that floor drain bodies remaining in slabs are sealed off completely. Remove associated piping serving decommissioned floor drains that are located in suspended slabs back to active mains that will remain in use.

### **3.5 CUTTING AND PATCHING, GENERALLY**

3.5.1 Perform work in compliance with applicable technical Specification Sections and requirements outlined in this Section.

3.5.2 Repair holes and damaged areas that are visible in ceilings, walls, and floors of finished spaces. Ensure that repaired construction matches adjacent existing construction and finish, unless otherwise indicated or specified.

3.5.3 Minor surface abrasions, small nail holes, cracks, aged checked natural wood finish, and other similar deterioration that are not visible under finished lighting conditions from a distance of 150 mm (6 in), do not need to be repaired if base material is sound and suitable for scheduled finishes, if any.

3.5.4 Coordinate cutting, patching, and openings with Subcontractors to avoid unnecessary and unscheduled work. Join new work to existing in a neat and accurate manner, and provide sound attenuation fillers at interior junctions with other building components.

3.5.5 Join new work to existing and install new supporting members, anchors, and other items necessary for completion of work. Provide temporary bracing where required.

3.5.6 Cut and patch The Work with care and precision, ensuring that patches match adjacent construction and finishes, unless indicated otherwise. Make junctions between new work and existing work, and matching material, form, construction, and finish, unless otherwise specified. Make junctions neat and discreet.

3.5.7 Ensure patching fits tightly around construction pipes, ducts, and conduits that pass through work and ensure air tightness.

3.5.8 Do not cut and patch operating elements and related components in a manner that reduces their capacity to perform for their intended purpose or that results in increased maintenance or decreased operational and life safety. Operating elements include without limitation, primary operational systems and equipment, air and smoke barriers, fire suppressions systems, mechanical systems including

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piping and ducts, control, communication, conveying and electrical wiring and special operating systems.

- 3.5.9 Do not cut and patch miscellaneous elements or related components that could change their loading capacity or result in increased maintenance or decreased operational and life safety. Miscellaneous elements include without limitation, water, moisture, air/vapour barriers, membranes and flashings, exterior curtain wall system, equipment supports, piping, ductwork, vessels and equipment, noise and vibration control elements and systems.
- 3.5.10 Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Replace construction that has been cut and patched in a visually unsatisfactory manner.
- 3.5.11 Make cuts clean and true with smooth edges, and fit units to tolerances established by existing work.
- 3.5.12 Fill unused and unfilled sleeves and holes, and fill unused sleeves in a manner that restores or maintains their original fire or acoustical STC rating.
- 3.5.13 If sprayed fire resisting, sound absorbing, or insulation applications are encountered that are not identified in Contract Documents or Available Information, inform Consultant for examination and instructions. Restore damaged non-asbestos type fireproofing to original condition before covering with finishes.
- 3.5.14 Repair adjacent construction and surfaces that are damaged or disturbed as a result of alterations.
- 3.5.15 Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform for purpose intended or that results in increased maintenance or decreased operational and life safety.
- 3.5.16 All new and existing penetrations through floor slabs within the Project boundary shall be sealed watertight.
- 3.5.17 Grout and seal penetration holes through exterior walls above grade as required to achieve a weather-tight seal.
- 3.5.18 Ensure penetration holes through exterior walls below grade are grouted and sealed to produce a watertight seal.
- 3.5.19 Where partitions are removed and there is no finished flooring present at base of previous partitions, provide new flooring to match existing flooring in the location where partition previously existed.

### **3.6 ALTERATION TO FIRE SEPARATIONS**

- 3.6.1 All new and existing penetrations through rated partitions and floor slabs within the Project boundary shall be sealed to provide a fire/smoke rating equal to or greater than the rating of the partitions or floor slab.
- 3.6.2 Ensure pipes, sleeves, ducts, conduit, and other penetrations through surfaces are properly sealed with fire and smoke penetration sealants.

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- 3.6.3 Maintain fire separations and provide fire and smoke penetration sealants in areas that are cut and patched. Firestopping must conform to CAN/ULC S115.

### **3.7 CUTTING AND PATCHING FOR MECHANICAL, ELECTRICAL AND OTHER MISCELLANEOUS ALTERATIONS**

- 3.7.1 Remove existing ceilings and walls, as necessary, for access to valves, piping, conduit, and tubing. Replace with new ceilings and walls as required.
- 3.7.2 Conceal capped services unless otherwise specified.
- 3.7.3 Mechanical and electrical alterations and repair work may be outside of areas anticipated for architectural work. Include for cutting, patching, repair and alterations beyond site limits or project boundaries in Contract Price.

### **3.8 STRUCTURAL ELEMENTS (CUTTING AND CORE DRILLING)**

- 3.8.1 Except where structural requirements are indicated on Drawings, do not cut, drill or sleeve load bearing members without first obtaining Consultant's written authorization for each condition. Perform drilling of existing work carefully, leaving a clean hole no larger than required.
- 3.8.2 If not specifically shown, but removal or alteration is required, perform such removal or alteration only upon written permission of the Consultant. Do not damage or alter any structural element of existing building. Core drill circular holes in concrete. Accurately cut new openings for electrical outlets and other recessed items in walls.
- 3.8.3 Cut and core drill existing concrete and masonry walls and slabs as necessary to accommodate alterations for passing services through existing assemblies.
- 3.8.4 Do not damage or alter any structural element of the existing building without obtaining Consultant permission.
- 3.8.5 Core drill circular holes in concrete and accurately cut new openings for recessed items in walls.
- 3.8.6 If core drilling or anchoring to reinforced concrete construction is required, conform to following procedures:
  - 3.8.6.1 Retain an independent testing company to locate existing reinforcement and conduit in the areas of proposed openings and to mark locations of the surfaces of slabs and walls on which the cores and cuts are to be started.
  - 3.8.6.2 Existing reinforcing bars in concrete structure may conflict with specific anchor locations or core drilling requirements. Review existing Drawings where available and undertake to locate position of reinforcing bars at locations of core drilling. Obtain permission in writing from Consultant regarding method of verification and examination of substrate.
  - 3.8.6.3 Avoid cutting through critical reinforcement and costly reinforcement bar contacts, electrical, ITS and conduits.



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- 3.8.7 Prior to cutting, sawing, breaking, or core drilling through structural and load-bearing members, provide non-destructive testing methods such as Ground Penetrating Radar system (GPR), X-ray examination, or Portable Steel Reinforcement Detection System s to detect conduits, cables, pipes, locations of live power or energy transmitted from power source such as feeds for electric motors, compressors, heating and cooling systems, and similar items in floor slabs and walls as applicable. Identify tendon locations and the potential for tendon tension release before starting work. Confirm final examination method with Consultant prior to commencing the work.
- 3.8.8 Include cost of conducting the non-destructing testing (GPR, X-ray or similar), examination after normal working hours in Contract Price.
- 3.8.9 Include cost of conducting core drilling operations after normal working hours in Contract Price.
- 3.8.10 Thoroughly examine areas and confirm the following: slab thickness, proper concrete cover over reinforcement, identification of rebar pattern, bar diameter and locations, detection of post tension cables, location of metallic and non-metallic pipes and conduits, detection of voids and concrete heterogeneity, and location of pipes and cables under slabs.
- 3.8.11 Conduct a thorough examination over a wider area than that required for coring or cutting, particularly in situations where conflicts with existing systems arise. Repeat scanning process as necessary until a suitable location for cutting and drilling is determined.
- 3.8.12 Ground Penetrating Radar (GPR): Verify that the GPR examination can be performed and ensure that access is available. Comply with requirements published by Concrete Sawing & Drilling Association "CSDA – Best Practice, Ground Penetrating Radar for Concrete Scanning" , latest edition.
- 3.8.13 X-Ray Scanning: Only use X-ray technology for scanning concrete with permission from Consultant and Owner, and when GPR is not likely to be successful. Ensure access for scanning is available on both sides of slab (i.e. above and below the slab). Include in Contract Price, cost of conducting X-ray examination and providing radiation shielding barriers.
  - 3.8.13.1 Handle and contain materials with special care to prevent radiation exposure to workers and building occupants. Comply with Health and Safety regulations in effect at Place of the Work.
- 3.8.14 Remove toppings before locating reinforcement and conduit, and mark locations and sizes of cores and openings, reinforcement and conduit locations using indelible markers.
- 3.8.15 Submit cut location and layout for review and obtain written acceptance from Consultant. Consultant will review marked-up locations weekly. If Consultant finds locations unacceptable, relocate proposed openings and repeat the process at no additional cost Owner.

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### **3.9 CONCRETE, GENERALLY**

- 3.9.1 Cutting: Saw cut where exposed to view. Jack hammering with electric or pneumatic equipment is acceptable only with scheduled permission of Owner.
- 3.9.2 Patching: Keep edges of existing concrete damp for 24 hours and scrub with neat Portland cement grout just before placing new concrete. Alternatively, accepted epoxy concrete adhesive may be used. Ensure finish matches the existing adjoining work. Unless otherwise indicated, use 20 MPa (3,000 psi) concrete conforming to CAN/CSA A23.1 for all patching. Install reinforcing bars and dowels if required. If installation of concrete is impractical, fill the openings with dry-packed non-shrink grout.

### **3.10 CONCRETE SLABS**

- 3.10.1 Level and prepare the existing concrete slabs to receive the proposed new floor finishes. Assume existing substrate is unsuitable to accommodate new Construction.
- 3.10.2 Thoroughly clean slabs removing laitance, oil, grease, and any other foreign matter that could be detrimental to the flooring application.
- 3.10.3 Prepare existing concrete slabs by shot blasting, grinding, or other means acceptable to the finish flooring manufacturer. Ensure that surfaces are clean and free of residue adhesives that do not contain harmful elements, ridges, trowel marks, gouges, or any other matter detrimental to bond of underlayment and flooring. Comply with ASTM F710.
- 3.10.4 Perform conducting moisture emission and pH tests to ensure that the alkali salt residue is within the acceptable limitations of flooring manufacturer. Comply with ASTM F1869 and ASTM F2170.
- 3.10.5 Ensure substrate is scraped to a smooth, level surface and leveled as necessary to accommodate flooring. Use self-leveling underlayment as appropriate for flooring application. Prepare for a flush application of the new flooring material.
- 3.10.6 Crack Repairs: Repair cracks, holes or other deficiencies in accordance with flooring manufacturer's recommendations. For cracks less than 1.5 mm (1/16") employ crack reinforcing tape in accordance with manufacturer's recommendations.
- 3.10.7 Obtain Consultant's acceptance of prepared substrates before installing concrete patching or self-leveling underlayment or flooring.
- 3.10.8 Substrate Remediation:
  - 3.10.8.1 Level all slabs with self-leveling underlayment to ensure that all floor areas are flush with adjacent areas. Prepare substrate to underlayment manufacturer's recommendations.
  - 3.10.8.2 Apply hydraulic cementitious underlayment over entire areas scheduled to receive new flooring. Gypsum based underlayment or "dry pack" mortars are not permitted due to their susceptibility to moisture. Underlayment shall have compressive strength of 27 MPa (4000 psi) after 28 Days.

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- 3.10.8.3 Apply hydraulic cementitious underlayment to manufacturer's instructions. Add aggregate as recommended by manufacturer to extend thickness.
- 3.10.8.4 Fill new and existing depressions, dished areas, low spots, voids, gaps, cracks, joints, holes, and other substrate defects with skim coat and self-leveling underlayment. Ensure the substrate is flat enough to prevent any object larger than 3mm from passing under a 3-meter straight edge, regardless of the direction of orientation, at any location.
- 3.10.8.5 Use aluminum retaining angles or other suitable means to contain the leveling coat in required areas.

### **3.11 TERRAZZO**

#### **3.11.1 Cutting:**

- 3.11.1.1 Remove defective topping and terrazzo work for full depth in complete panels to the nearest divider strip.
- 3.11.1.2 Cut, drill and fit terrazzo that may be required for installation of piping, services, hardware and similar items abutting or extending through terrazzo.

#### **3.11.2 Cleaning:**

- 3.11.2.1 Clean with cold water and detergent solution using a fiber brush. If detergent solution is not effective, clean with a product specifically designed for terrazzo floors.
- 3.11.2.2 Apply product by brush or roller according to the manufacturer's written instructions. Allow product to sit on the surface for the period recommended by the manufacturer.
- 3.11.2.3 Rinse thoroughly with clean water.

#### **3.11.3 Wax Removal:**

- 3.11.3.1 Remove wax with diamond pads in accordance with manufacturer's recommendations and TTMAC/ACTTM standards.

#### **3.11.4 Grinding:**

- 3.11.4.1 Using a terrazzo floor grinding machine, remove a thin layer of terrazzo using diamonds #30, #50, and #120.
- 3.11.4.2 When finished, remove mud and rinse with clean water.
- 3.11.4.3 Re-grind terrazzo with diamonds #220, #400, and #600, keeping the floor wet until terrazzo is free of scratches.
- 3.11.4.4 Remove mud and rinse surface thoroughly.
- 3.11.4.5 If terrazzo is cement-based, grout with cement/acrylic mix that matches matrix of existing terrazzo. Fill all pinholes and voids.
- 3.11.4.6 If the terrazzo is resin-based, allow surface to dry completely, then grout using an epoxy resin that matches the terrazzo matrix. Fill all pinholes and voids.

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- 3.11.4.7 Allow grout to remain on the surface until completely cured. Grind with diamonds #800, #1800, #3500, and #8500 until all grout has been removed from terrazzo surface.
- 3.11.4.8 Wash and rinse the terrazzo with a neutral cleaner and allow the terrazzo to dry completely. Apply appropriate sealer according to the manufacturer's instructions.
- 3.11.4.9 Use the same procedure for terrazzo baseboards, using special baseboard machines or appropriate discs.
- 3.11.5 Patching:
  - 3.11.5.1 Remove all loose and unstable materials and clean thoroughly.
  - 3.11.5.2 Use a suitable bonding agent, epoxy or cement-based bonding materials and an aggregate mix consistent with that used for existing terrazzo floors.
  - 3.11.5.3 After curing, sand the affected areas with diamond pads until the area has a finish similar to the surrounding floor.
  - 3.11.5.4 Allow the area to dry, then apply a suitable terrazzo sealer as recommended by the manufacturer.
  - 3.11.5.5 Match terrazzo patching to approved samples and original installation.
- 3.11.6 Cracks:
  - 3.11.6.1 For cracks that are 6 mm or larger, use a chipping tool to increase opening and to make opening irregular on both sides. Mix same type of aggregate and binder and force it into crack. Ensure that mixture protrudes slightly from the existing terrazzo floor to allow for proper sanding. Once mixture is fully cured, sand repaired area and apply terrazzo sealer.
  - 3.11.6.2 For cracks less than 6 mm: fill with the same bonding matrix that was originally used.
- 3.11.7 Repair of damaged existing treads: Use cement, marble chips and non-slip aggregate in proportion and colours to achieve repair work matching existing. Reinforce treads with reinforcing mesh and longitudinal steel rods spaced to match existing. Match thickness of finished terrazzo topping to existing. Protect edges of precast terrazzo units from damage.
- 3.11.8 Match reinstated work to adjacent existing terrazzo work, including divider strips where replacement necessary.
- 3.11.9 Repair terrazzo after other trades have finished and leave clean and neat. Contract Price includes for repair of cracks in floors and cracks in terrazzo profiled bases.

### **3.12 RESILIENT FLOORING**

- 3.12.1 Cutting and Removal:

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- 3.12.1.1 Remove existing resilient flooring in accordance with "Recommended Work Practices for Removal of Resilient Floor Coverings", latest edition as published by Resilient Floor Covering Institute.
- 3.12.1.2 Remove existing flooring and bases from indicated areas, unless other Sections specify otherwise. Remove all flooring, adhesive, and setting bed materials down to the concrete substrate.
- 3.12.1.3 Prepare, mix, and apply coatings to neutralize adhesive and setting bed residues and provide a suitable substrate for scheduled flooring in accordance with manufacturer's instructions.
- 3.12.1.4 As resilient flooring may contain asbestos fibers and crystalline silica, avoid sanding, dry sweeping, dry scraping, drilling, sawing, bead blasting, or mechanically chipping or pulverizing existing resilient flooring, backing, lining felt, asphaltic "cutback" adhesive, or other adhesive. Refer to Designated Substances Report appended to Section 00 31 00 for locations of materials suspected to contain hazardous or toxic substances.
- 3.12.1.5 Prepare existing substrates to acceptance of Consultant. Ensure substrate is suitable and compatible with the subsequent applied underlayment or floor finishes. If necessary, provide a moisture reduction barrier.
- 3.12.2 Patching and New Installation:
  - 3.12.2.1 Prepare subfloors to receive resilient tile flooring in accordance with ASTM F710 and manufacturer's written recommendations.
  - 3.12.2.2 Fill cracks, holes and other defects with cementitious patching compound. Trowel patching compound smooth and level with surrounding surfaces and allow to dry and set. Prohibit traffic until the patching compound cures.
  - 3.12.2.3 Where resilient flooring adjoins thicker floor materials, apply underlayment, feathered out to make up difference in level between Products.
  - 3.12.2.4 Provide resilient flooring in accordance with the manufacturer's printed installation instructions and using recommended adhesive. Provide Products in each area from the same production run. Accurately scribe flooring materials around walls, columns, floor outlets and other floor penetrations. Pattern shall match existing resilient tile flooring.
  - 3.12.2.5 In areas where built-in millwork or fitments are present, lay flooring in full lengths and widths of areas, disregarding the locations of millwork or fitments.
  - 3.12.2.6 Terminate flooring at center line of doors in openings where adjacent floor finish or color is dissimilar.
  - 3.12.2.7 Install resilient edge strips at unprotected edges of resilient tile flooring. At door openings, install resilient edge strips below the center line of the door.

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- 3.12.2.8 Install resilient edge strips according to the manufacturer's printed installation instructions, using the specified adhesive, with a continuous coating of adhesive, tight joints, and proper alignment.
- 3.12.2.9 Install resilient edge strips in longest lengths possible, with neatly mitred corners.
- 3.12.2.10 Terminate flooring at centre line of door in openings where adjacent floor finish or colour is dissimilar.
- 3.12.2.11 Remove and replace loose, damaged, and defective resilient tile flooring where required and as directed by Consultant.
- 3.12.2.12 Protect newly laid resilient tile flooring from construction traffic for a period of two weeks to allow the flooring to bond firmly. At the end of this time, clean flooring with cleaner and apply sealer (if required) and finish in accordance with the manufacturer's instructions.
- 3.12.2.13 Work must be handed over to Owner free of blemishes and in perfect condition.

### **3.13 GYPSUM PARTITIONS**

- 3.13.1 If walls or partitions that are removed extend from one finished area into another, patch and repair wall surfaces in new space to provide even surface with uniform finish, color, texture, and appearance. If necessary, remove wall coverings and replace with new materials to achieve uniform color and appearance.
- 3.13.2 Patching:
  - 3.13.2.1 Where mechanical, electrical, and architectural work penetrates existing finishes, patch and repair existing gypsum finishes with new finishes to match existing. Conform to requirements of ASTM C840.
  - 3.13.2.2 Provide proper ventilation to dry finished surfaces during and after installation. In enclosed areas without proper ventilation and air circulation, provide additional temporary, portable mechanical ventilation.
  - 3.13.2.3 If patching occurs in a painted surface, apply primer and intermediate paint coats over patch. Apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces to satisfaction of Consultant.

### **3.14 TEMPORARY CEILING REMOVAL**

- 3.14.1 Minimize exposure of occupied spaces to work areas above finished ceiling during work. Remove only limited ceiling panels as required to complete work in such areas. Endeavour to complete work requiring ceiling access within 2 working days or less. Reinstall or repair removed ceiling panels immediately.
- 3.14.2 Work and coordinate with electrical, IT, security, and mechanical trades to determine full scope of temporary ceiling removal required to allow for feeder runs and other necessary work by those Sections (extent of ceiling removal has not been shown on Drawings).

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- 3.14.3 Provide temporary protection, signage, and barriers to protect others during ceiling access operations.
- 3.14.4 Remove tiles, panels, and tee-bar suspension from the area required by other trades.
- 3.14.5 After completion of work by other trades and required inspections, reinstate tee-bar and acoustic tile. If the tile or tee-bar is damaged, bent, discolored, scratched, or appears of lesser quality than the surrounding area, replace with new material.
- 3.14.6 Note that plaster ceilings in existing buildings may have a fire resistance rating and be part of a membrane fire separation. Verify and maintain existing fire rating.
- 3.14.7 Remove and replace gypsum board bulkheads and ceilings in areas as required for access. Reinstate removed construction to match existing finishes and Make Good as necessary.

### **3.15 ARCHITECTURAL WOODWORK**

- 3.15.1 Cutting: Cut back to a joint or panel line.
- 3.15.2 Patch as required. Remove and replace millwork with new in accordance with 06 40 00.

### **3.16 EXISTING DOORS, FRAMES, AND SASH**

- 3.16.1 Cutting and Removal: Remove in such manner as to facilitate filling in of openings or installation of new work, as required by Drawings.
- 3.16.2 Modify existing steel door frames with cutouts, hardware blanking, reinforcing, tapping and drilling arrangements, repairs to accommodate new doors and other preparations;
- 3.16.3 Grind exposed welds smooth and flush. Fill open joints, seams and depressions with filler or by continuous brazing or welding. Grind smooth to true sharp arises and profiles and sand down to smooth, true, uniform finish. Perform welding to CSA W59-M.
- 3.16.4 Where existing frame required replacement:
  - 3.16.4.1 Fabricate frames to match existing in every respect; Reinforce frame as required for surface mounted hardware.
  - 3.16.4.2 Where frames occur in masonry Provide strip strap, T-strap or wire type anchors. Where frames occur in gypsum board Provide stud type anchors.
  - 3.16.4.3 Mitre corners of frames. Cut frame mitres accurately and weld continuously on inside of frame. Protect mortise cut outs with mortar guard boxes.
  - 3.16.4.4 Factory apply touch-up primer to areas where zinc coating has been removed during fabrication.

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### **3.17 PAINTING AND FINISHING**

- 3.17.1 Prepare the patched areas as necessary for new work. Wash areas to be repainted with neutral soap or detergent, thoroughly rinse, and sand when dry. Feather remaining paint edges smooth with sandpaper. Comply with requirements of the MPI Painting Manual and MPI Maintenance Repainting Manual.
- 3.17.2 Conform to applicable provisions of Section 09 91 00. Prepare and build up bare areas and patches in existing painted surfaces with proper primer and intermediate coats, sand smooth, and flush with adjoining surfaces. Paint areas scheduled to be painted and/or repainted as specified Specifications.

### **3.18 PROTECTION**

- 3.18.1 During performance of work, adequately protect work completed and in progress, and existing work to remain, such as floors, finishes, trim, and similar components, as completely as possible to minimize replacement of damaged work by each Subcontractor and trade. Work damaged or defaced due to failure to Provide adequate protection shall be repaired, or removed and replaced as directed by Consultant.
- 3.18.2 Protect active services which are intended to remain and which pass through spaces involved in alterations and repairs.

### **3.19 CLEANING AND RESTORATION**

- 3.19.1 Clean up all material, debris, and rubbish resulting from remodeling work, remove from the building and Site, and legally dispose of. Leave all areas of work in "broom clean" condition.
- 3.19.2 All debris shall be transported out of the building in covered carts with no materials extending above the cart rim.
- 3.19.3 Make Good surfaces and finishes damaged or disturbed due to The Work to match existing. Ensure materials used to repair damage are compatible with existing.
- 3.19.4 Restore site to condition equal to or, if specified elsewhere, better than existing conditions.
- 3.19.5 Restore areas outside of limits of The Work which are disturbed to original conditions in addition to complying with requirements of Contract Documents.

**END OF SECTION**



## **PART 1 – GENERAL**

### **1.1 General and Related**

- .1 All Sections of the *Contract Documents* Package form a part of the *Contract Documents* and shall be read entirely to determine their effect upon the work of this Section. Read this section in conjunction with all other sections so as to comply with the requirements of the General Conditions of the Contract.
- .2 Related Work Specified Elsewhere

Division 1	Section 01 35 33	Infection Prevention and Control
Division 2,	Section 02 82 20	Type 2 Asbestos Abatement
Division 2,	Section 02 82 30	Type 3 Asbestos Abatement
- .3 The site conditions identify the location of known Asbestos-Containing Materials (ACM) to be disturbed by Work of this Contract. The specification fulfils the requirements of the report required by R.R.O. 2005, Reg. 278 as amended by O. Reg. 510/92, Section 10.
- .4 Reports titled "Limited Designated Substance Survey Report, Sunnybrook Health Sciences Centre, K2E & K3E Renovations," Maple Project 22765 dated July 15, 2025 forms a part of the Contract Documents.
- .5 It is the intent that Work performed as per this section will result in the removal and disposal of all ACM specified for removal in the architectural Drawings and the decontamination of all materials that have been contaminated by ACM either prior to or during Work of this section.

### **1.2 Project Summary**

- .1 The overall scope of the Project includes the renovation of the Second Floor and Third Floor in K-Wing East Pod. The removal of asbestos-containing vinyl sheet flooring present throughout the project area will be required as part of the project. Work will be completed in multiple phases as indicated in architectural drawings and specifications.
- .2 The contractor should take into consideration the following additional general information:
  - .1 Where asbestos procedures are specified, the contractor must also observe Infection Prevention and Control (IPAC) Procedures, specified elsewhere. Where there is a conflict between procedures, the more stringent procedure shall apply.
  - .2 All asbestos work is to be conducted in phases as specified in other Sections.

### **1.3 Site Conditions**

- .1 Vinyl sheet flooring backing material contains Chrysotile Asbestos.
  - .1 The location of ACM vinyl sheet is identified on Drawings AR-01 and AR-02.
  - .2 ACM vinyl sheet flooring must be assumed to be present below some partitions walls and millwork but is not indicated on Drawings.

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- .3 Removal of vinyl sheet flooring backing material in other areas of the building has required the use of grinders. The use of grinders and power tools for removal must be assumed.

- .2 No other asbestos-containing materials are known to be present in the project area.

#### **1.4 Outline of Work**

- .1 All work is to be conducted in specific phases as specified elsewhere. Cooperate with General Contractor and Owner's Representative on coordination of project phasing and establishing Asbestos Work Areas.
- .2 Where asbestos procedures are specified, they must be performed in conjunction with IPAC Procedures (specified elsewhere). Where there is a conflict in procedures, the more stringent procedure shall apply.
- .3 Using Type 3 Asbestos Abatement Procedures as specified in Section 02 82 30; remove all vinyl sheet flooring present in the Work Area.
  - .1 Provide a minimum of one (1) layer of rip-proof polyethylene sheeting on all Work Area perimeter walls.
  - .2 Protect remaining perimeter walls, fixtures, contents, etc. with a minimum of one (1) layer of 6-mil polyethylene sheeting.
  - .3 Shut down and isolate HVAC system from Work Area.
  - .4 Install a three (3) stages Worker Decontamination Facility complete with shower at the entrance to the Work Area.
  - .5 Provide negative pressure to Asbestos Work Areas as specified.
  - .6 Clean and protect with polyethylene and temporarily support existing light fixtures for reinstallation (reinstallation by others).
- .4 The use of Type 2 procedures as specified in Section 02 82 20 may be used for minor areas of vinyl sheet flooring removal (ie. below decontamination facility or at hoarding line boundaries), provided no power tools are used for removal of ACM.
- .5 Dispose of as asbestos waste, all materials removed by work of this project, unless specified otherwise.

#### **1.5 Schedule**

- .1 Perform all Work in accordance with the Contract and work phasing plans.
- .2 Co-operate with project stakeholders including; the building Owner and the building owner's representatives as applicable.

#### **1.6 Supervision**

- .1 Provide an on-site superintendent that has the authority to oversee all aspects of the Work, including but not limited to, negotiation of changes to the Contract, scheduling, manpower, equipment, production, and communication and co-ordination with Consultant.

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- .2 The Consultant reserves the right to reject or accept any Superintendent without explanation.
- .3 Supervisory personnel must hold a recognized certificate proving certification as an Asbestos supervisor in the province of Ontario as required by Regulation 278/05, and have supervised a minimum of five (5) other Asbestos abatement projects.
- .4 Supervisory personnel must be on site at all times during Work that may disturb ACM.
- .5 The contractor cannot replace supervisory personnel without written approval from the Consultant.

### 1.7 Quality Assurance

- .1 Ensure the removal and handling of ACM or Asbestos contaminated materials is performed by trained and competent personnel having obtained certification to perform Work in a Type 3 Operation in the Province of Ontario as required by Regulation 278/05. The Consultant reserves the right to remove any personnel that, in their opinion, does not meet these qualifications.
- .2 All related Work of this section shall be performed by licensed persons, experienced and qualified for the Work required.
- .3 The Consultant is empowered to order Work to stop when a breach of the containment enclosure has, or is likely to occur. Cost of additional Work by contractor and/or Consultant to remedy conditions shall be the burden of the Asbestos Abatement contractor.
- .4 The Asbestos Abatement contractor is solely responsible for the control of the project, construction practices, his subcontractors or their agents, employees or other persons performing any of the Work.

### 1.8 Definitions

- .1 Airlock: A system for permitting ingress or egress without permitting air movement between a contaminated area and an uncontaminated area, typically consisting of two Curtained Doorways at least 1.5 m apart.
- .2 Air Monitoring: The process of measuring the fibre content of a specific volume of air.
- .3 Amended Water: Water with a non-ionic Surfactant wetting agent added to reduce water surface tension to 35 or less dynes, to allow thorough wetting of Asbestos fibres.
- .4 Asbestos: The asbestiform varieties of serpentinite (chrysotile), riebeckite (crocidolite), cummingtonite-grunerite, anthophyllite, and actinolite-tremolite. For purposes of determining Respiratory and worker protection both the asbestiform and non-asbestiform varieties of the above minerals and any of these materials that have been chemically treated and/or altered shall be considered as Asbestos.
- .5 Consultant: The person designated by the Owner to act for it on matters pertaining to the inspection, Air Monitoring, and certification of the contractor's Work.
- .6 Asbestos-Containing Material (ACM): Any material containing Asbestos of any type or mixture of types.

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- .7 Asbestos-Containing Waste: Any material which is or is suspected of being or any material contaminated with an Asbestos-Containing Material which is to be removed from a Work Area for disposal.
- .8 Asbestos Debris: Pieces of ACM that can be identified by colour, texture, or composition, or means dust, if the dust is determined by an accredited Consultant to be ACM.
- .9 Asbestos Work Area: Where the actual removal, sealing and enclosure of Asbestos-Containing Materials takes place.
- .10 Authorized Visitor: The Owner or his approved representative and/or persons representing regulatory agencies.
- .11 Barrier: Any surface that seals off the Work Area to inhibit the movement of fibres.
- .12 Clean Area: Either an operating area or an area in which removal Work has already been completed.
- .13 Common mercury: electrical switches, thermostats, thermometers, barometers or other measuring devices or fluorescent lamps that contain mercury.
- .14 Curtained Doorway: An arrangement of closures to allow ingress and egress from one room to another while permitting minimal air movement between rooms, typically constructed by placing two overlapping sheets of Polyethylene over an existing or temporarily framed doorway, securing each along the top of the doorway, securing the vertical edge of one sheet along one vertical side of the doorway, and securing the vertical edge of the other sheet along the opposite vertical side of the doorway. All free edges of Polyethylene shall be reinforced with duct tape and the bottom edge shall be weighted to ensure proper closing. Each Polyethylene sheet shall overlap openings not less than 1.5 m on each side.
- .15 Demolition: The wrecking or taking out of any building component, system, finish or assembly of a facility together with any related handling operations.
- .16 Disposal Bag: A properly labelled 6 mil thick leak-tight plastic bag used for transporting Asbestos-Containing Waste from the Work Area to the disposal site.
- .17 D.O.P. Test: Dioctylphthalate aerosol challenge of a HEPA Filter system and is used to establish the integrity and effectiveness of the system to Filter out Asbestos fibres.
- .18 Encapsulant: A material that surrounds or embeds Asbestos fibres in an adhesive matrix, to prevent release of fibres.
  - .1 Bridging Encapsulant: an Encapsulant that forms a discrete layer on the surface of an in situ Asbestos matrix
  - .2 Penetrating Encapsulant: an Encapsulant that is absorbed by the in situ Asbestos matrix without leaving a discrete surface layer
  - .3 Removal Encapsulant: a penetrating Encapsulant specifically designed to minimize fibre release during removal of Asbestos-Containing Materials rather than for in situ Encapsulation.
- .19 Encapsulation: Applying to Asbestos-Containing Materials, with an Encapsulant.
- .20 Filter: A media component used in Respirators, vacuum cleaners or Negative Pressure Filter fan units to remove solid or liquid particles from the inspired air.

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- .21 Fitting: Unless otherwise described in site conditions, all connections of a pipe which include elbows, ends, caps, valves, hangers, tees and unions.
- .22 Friable Asbestos Material: Material that contains Asbestos that can be crumbled, pulverized, or reduced to powder by hand pressure when dry.
- .23 Glove Bag: A sack with inward projecting long sleeve gloves, which are designed to enclose an object from which an Asbestos-Containing Material is to be removed.
- .24 Hazardous Mercury: uncontrolled elemental mercury waste present as a solid or liquid that is not contained within a pre-manufactured sealed vessel.
- .25 HEPA Filter: High Efficiency Particulate Aerosol Filter that is at least 99.97 percent efficient in collecting a 0.3 micrometre aerosol.
- .26 Negative Pressure: A system which extracts air directly from Work Area, Filters such extracted air through a High Efficiency Particulate Air Filtering system, and discharges this air directly outside Work Area to exterior of building. This system shall maintain a minimum Pressure differential of 0.02 inches water gauge relative to adjacent areas outside of Work Areas, be equipped with an alarm to warn of system breakdown, and be equipped with an instrument to continuously monitor and automatically record Pressure differences.
- .27 Negative Pressure Respirator: A Respirator in which the air Pressure inside the Respiratory-inlet covering is positive during exhalation in relation to the air Pressure of the outside atmosphere and negative during inhalation in relation to the air Pressure of the outside atmosphere.
- .28 Occupied Area: Any area of the building outside the Asbestos Work Area.
- .29 Polyethylene: A sheeting of type and thickness specified sealed with tape along all edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide a continuous Polyethylene membrane to protect underlying surfaces from water damage or damage by sealant, and to prevent escape of Asbestos fibres through the sheeting into a Clean Area.
- .30 Positive Pressure Respirator: A Respirator in which the air Pressure inside the Respiratory inlet covering is positive during inhalation and exhalation in relation to the air Pressure of the outside atmosphere.
- .31 Respirator: A device designed to protect the wearer from the inhalation of harmful atmospheres.
- .32 Straight Run Pipes: Part of the building system not included under the description of fitting, including but not limited to straight, angled or curved sections of pipe, pumps, headers and reducers.
- .33 Surfactant: A chemical wetting agent added to water to improve penetration, thus reducing the quantity of water required for a given operation or area.
- .34 Uncontaminated Areas: Areas that have yet to under abatement, or areas that have already undergone abatement and are deemed safe for occupancy without the use of asbestos related protection equipment.
- .35 Water Filtration System: A multi-stage filtration system for filtering shower and wastewater. Typically constructed with at least two filters, the primary stage retains 20 microns or larger particles and the final stage removes 5 micron or larger particles.

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- .36 Wet Cleaning: The process of eliminating Asbestos contamination from building surfaces and objects by using cloths, mops, or other cleaning utensils which have been dampened with Amended Water or diluted Removal Encapsulant and afterwards thoroughly decontaminated or disposed of as Asbestos-Containing Waste.
- .37 Work: Includes all services, labour and material required to complete the work as specified in the Contract.

## 1.9 Regulations

- .1 Comply with Federal, Provincial, and local requirements pertaining to Asbestos, provided that in any case of conflict among those requirements or with these *Contract Documents* the more stringent requirement shall apply. The regulations shall include but not be limited to the following:
  - .1 Ontario Ministry of Labour, Occupational Health and Safety Division, Regulation Respecting Asbestos on Construction Projects and in Buildings and Repair Operations, O. Reg. 278/05.
  - .2 Ontario Ministry of the Environment Regulation 347, under the Environmental Protection Act.
  - .3 Ontario Ministry of Labour document, "Lead on Construction Projects", dated September, 2004.
  - .4 Government of Canada Regulations respecting the Handling, Offering for Transport and Transporting of Dangerous Goods. (Extract from the Canada Gazette Part II, dated February 6, 1985).
  - .5 Regulations for Construction Projects O. Reg. 213/91.
  - .6 Office of the Fire Commissioner of Canada.
  - .7 Ontario Hydro Electrical Safety Code.
  - .8 Ontario Occupational Health and Safety Act RSO 1990 c0.1 as amended.
  - .9 WHMIS Regulations RRO 1990 Reg. 860.

## 1.10 Notification

- .1 Notify the Ministry of Labour, Construction Health and Safety Branch, as per R.R.O. 2005, Reg. 278 as amended by O. Reg. 510/92, for any Type 3 Asbestos Abatement or Glove Bag Abatement Work.
- .2 Notify Sanitary Landfill site as per Ontario Regulation 347.
- .3 Inform all sub trades of the presence of friable ACM identified in the site conditions.
- .4 Notify immediately Ontario Ministry of Labour, as required by Regulation 278 as amended by O. Reg. 510/92, Section 7, if friable materials not identified in the site conditions are discovered during the project.

## 1.11 Submittals

- .1 Submit prior to starting work:
  - .1 Permits for transportation of Asbestos-Containing Waste and location of landfill.

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- .2 Names and credentials of supervisory personnel.
- .3 Proof in the form of a certificate that supervisory personnel have attended a training course on Asbestos removal.
- .4 Proof with references that supervisory personnel have supervised at least five other Asbestos removal projects.
- .5 Proof in the form of a certificate that supervisory personnel have attended a training course on lead removal.
- .6 Proof with references that supervisory personnel have supervised at least five other lead removal projects.
- .7 Proof that workers have received WHMIS training.
- .8 Work Place Safety and insurance Clearance Certificates.
- .9 Proposed schedule including all stages of work.
- .10 Shop *Contract Documents* for each Work Area detailing waste and worker decontamination facilities, platform and hoarding layouts, location of negative air discharge panels, Material Safety Data Sheets for chemicals or materials used in the course of the project.
- .11 Data Sheets for chemicals or materials used in the course of the project.
- .12 Negative air unit performance data and results of D.O.P. Tests as required.
- .13 Certificate proving that each worker on site has been fit tested for the Respirator appropriate for the work being performed.
- .14 Pre-removal survey of damage in all areas where Asbestos abatement will take place or waste will be transported.
- .15 Ministry of Labour Notice of Project form.

**1.12 Worker Protection**

- .1 Refer to applicable related work section.

**1.13 Visitor Protection**

- .1 Provide clean protective clothing and equipment and approved Respirators to Authorized Visitors.
- .2 Ensure Authorized Visitors have received required training for entry into Work Area.

**1.14 Air Monitoring**

- .1 Air Monitoring will be performed following the National Institute for Occupational Safety and Health method 7400 for Asbestos.
- .2 The contractor shall cooperate fully with the Consultant in the collection of Air Monitoring samples, including the collection of personal worker samples.

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- .3 Results of PCM samples of 0.05 fibres per millilitre of air (fibre/mL) or greater, outside of Asbestos Work Area, will indicate Asbestos contamination of these areas. The contaminated areas shall be isolated and cleaned in the same manner applicable to the Asbestos Work Area, at no cost to the Owner.
- .4 Clearance Air Monitoring samples for Asbestos Work Area will be collected after a suitable settling period following application of lock-down agent. Clearance levels must be less than 0.01 fibre/mL for the Work Area to be deemed clean. Contractor to provide aggressive air sampling equipment (leaf blower and fan) for project Consultant's use.

**PART 2 – PRODUCTS**

- 2.1 Refer to applicable Sections 02 82 20 and 02 82 30 for Products.**

**PART 3 – EXECUTION**

- 3.1 Refer to applicable Sections 02 82 20 and 02 82 30, for Execution.**

**END OF SECTION**



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## **PART 1 – GENERAL**

### **1.1 General and Related Work**

- .1 All Sections of the Specifications Package form a part of the Contract Documents and shall be read entirely to determine their effect upon the work of this Section. Read this section in conjunction with all other sections so as to comply with the requirements of the General Conditions of the Contract.
- .2 The Specification Package fulfils the requirements of the “Report” required by R.R.O. 2005, Reg. 278 Section 10.
- .3 Related work specified elsewhere:

Division 1	Section 01 35 33	Infection Prevention and Control
Division 2,	Section 02 82 00	Asbestos Abatement – Scope and Details
Division 2,	Section 02 82 30	Type 3 Asbestos Abatement
- .4 It is the intent that work performed as per this Section will result in the removal and disposal of all ACM specified for removal and the decontamination of all materials that have been contaminated by asbestos during work of this Section.

### **1.2 Site Conditions**

- .1 Refer to Section 02 82 00, Scope and Details for Site Conditions.

### **1.3 Outline of Work**

- .1 Refer to Section 02 82 00, Scope and Details for Outline of Work.

### **1.4 Schedule**

- .1 Refer to Section 02 82 00, Scope and Details for Schedule.

## **PART 2 – PRODUCTS**

### **2.1 Materials and Equipment**

- .1 Polyethylene Sheeting: A single polyethylene film, 0.15 mm (6 mil) minimum thickness unless otherwise specified
- .2 Rip Proof Polyethylene Sheeting: Woven fibre reinforced fabric bonded both sides with polyethylene sheeting. 0.20 mm (8 mil) fabric made up from 0.13 mm (5 mil) weave and 2 layers 0.04 mm (1.5 mil) poly laminate.
- .3 Flame-Resistant Polyethylene Sheeting: A single polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-Resistant Textiles and Films, 0.15 mm (6 mils) thickness.
- .4 Drop Sheets: In polyethylene type and size appropriate for the work being performed.

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- .5 Tape: Reinforced cloth or fibreglass reinforced tape in 2" or 3" widths suitable for sealing polyethylene sheeting under both wet conditions using amended water, and dry conditions.
- .6 Spray Cement: Spray adhesive in aerosol cans which is specifically formulated to stick tenaciously to sheet polyethylene.
- .7 Caulking: One component non-staining acrylic polymer sealant to conform to GSB Specification 19GP-5M.
- .8 Foam: Low density polyurethane expanding foam Froth-Pack or equivalent or better.
- .9 Wetting Agent: Non-sudsing surface active agent. Acceptable product Aqua-Gro or approved equal.
- .10 Sealer: Slow-drying sealer shall be a non-staining, clear, water dispersible type that remains tacky on the surface for a minimum of 8 hours for the purpose of trapping any residual airborne fibres during the settling period. The product must have flame spread and smoke development ratings both less than 50 and shall leave no stain when dry. Acceptable products: Borden Polyco 804, Double AD TC-55, equivalent or better. Also referred to as "Lockdown Agent".
- .11 Encapsulant: Type 1 penetrating Class A water based encapsulant conforming to CGSB 1-GP-205M and approved by the Fire Marshall having flame spread and smoke development ratings both less than fifty (50). Acceptable products: Ocean 666, Decadex Fire Check equivalent or better.
- .12 Asbestos Waste Containers: Waste shall be contained in two separate containers which shall be dust-tight and impervious to asbestos and any chemicals used during the removal process. The inner container shall be a sealable polyethylene bag (or where the glove bag method is used, the glove bag itself). Where there are sharp objects included in the waste material, the outer container shall be a sealable fibre type drum, otherwise the outer container may either be a sealable polyethylene bag. Containers shall be as follows:
  - .1 Polyethylene Waste Bag: 0.15 mm (6 mil) thick leak-tight polyethylene bags labelled as required by sub-section 3.5 Waste Disposal.
  - .2 Fibre Drums: 55 US gallon capacity heavy duty leak tight fibre drums with tight sealing locking metal top and metal bottom.
  - .3 Labels: Waste containers shall have a pre-printed cautionary asbestos warning label, acceptable to local dump authorities, clearly visible when ready for removal to disposal site.
- .13 First Aid Supplies: Comply with governing regulations and recognized recommendations within the construction industry.
- .14 Ground Fault Panel: Electrical panel, installed by licensed electrician and equipped as follows:
  - .1 Ground fault circuit interrupters of sufficient capacity to power temporary electrical equipment and lights in Asbestos Work Area.
  - .2 Interrupters to have a 5 mA ground fault protection.

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- .3 Necessary accessories including main switch disconnect, ground fault interrupter lights, test switch to ensure unit is working, and reset switch.
- .4 Openings sealed to prevent moisture or dust penetration.
- .15 HEPA Vacuum: Vacuum with necessary fittings, tools and attachments. Discharged air must pass through a HEPA filter.
- .16 Lock-down Agent: Sealant for purpose of trapping residual dust. Product must have flame spread and smoke development ratings both less than 50. Product shall leave no stain when dry. Lock-down agent shall be compatible with replacement insulation or fireproofing where required and capable of withstanding service temperature of substrate.
- .17 Negative Air Unit: Portable air handling system which extracts air directly from the Asbestos Work Area and discharges the air to the exterior of the Asbestos Work Area. Equipped as follows:
  - .1 Prefilter and HEPA filter. Air must pass HEPA filter before discharge.
  - .2 Pressure differential gauge to monitor filter loading.
  - .3 Auto shut off and warning system for HEPA filter failure.
  - .4 Separate hold down clamps to retain HEPA filter in place during change of prefilter.
- .18 Protective Coveralls: Disposable full body coveralls complete with hoods manufactured of a material which does not permit penetration of asbestos fibres.
- .19 Airless Sprayer: Spray equipment for amended water: for application to asbestos-containing materials for saturation prior to removal. Airless spray units are only acceptable, such as Grace Hydrospray or approved equal.
- .20 Power Washer: Spray equipment for saturation of asbestos-containing material with amended water for cleaning of surfaces in abatement work area after asbestos removal, capable of delivering an airless stream of water at a pressure of not less than 1200 psi or exceeding 2500 psi.
- .21 Fine Atomizing Spray Nozzle: Nozzle for airless sprayer capable of delivering not less than 1 gallon per minute of fine particle spray of amended water.
- .22 Garden Sprayer: A hand pump type pressure-can garden sprayer fabricated out of either metal or plastic, equipped with a metal wand at the end of a hose that can deliver a stream or fine spray of liquid of amended water under pressure.
- .23 Scaffolding: The type, erection and use of all scaffolding shall comply with all applicable OSHA provisions.
- .24 Temporary Lighting: Provide general service incandescent lamps or fluorescent lamps of wattage required for adequate illumination as required by the work. Protect lamps with guard cages grounded together to distribution panel or tempered glass enclosures.
- .25 Electrical Power Cords: Use only grounded extension cords; use "hard-service" cords where exposed to abrasion and traffic. Use single lengths or use waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas of work.

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## **2.2 Regulations**

- .1 Comply with Federal, Provincial, and local requirements pertaining to asbestos, provided that in any case of conflict among those requirements or with these specifications the more stringent requirement shall apply. The regulations shall include but not be limited to the following:
  - .1 Ontario Ministry of Labour, Occupational Health and Safety Division, Regulation Respecting Asbestos on Construction Projects and in Buildings and Repair Operations, O. Reg. 278/05.
  - .2 Ontario Ministry of the Environment Regulation 347, under the Environmental Protection Act.
  - .3 Government of Canada Regulations respecting the Handling, Offering for Transport and Transporting of Dangerous Goods. (Extract from the Canada Gazette Part II, dated February 6, 1985).
  - .4 Regulations for Construction Projects O. Reg. 213/91.
  - .5 Office of the Fire Commissioner of Canada.
  - .6 Ontario Hydro Electrical Safety Code.
  - .7 Ontario Occupational Health and Safety Act RSO 1990 c0.1 as amended.
  - .8 WHMIS Regulations RRO 1990 Reg. 860.

## **2.3 Notification**

- .1 Notify Sanitary Landfill site as per Ontario Regulation 347.
- .2 Inform all sub trades of the presence of friable ACM identified in the site conditions.
- .3 Notify immediately Ontario Ministry of Labour, as required by Regulation 278 as amended by O. Reg. 510/92, Section 7, if friable materials not identified in the site conditions are discovered during the project.

## **2.4 Submittals**

- .1 Submit prior to starting work:
  - .1 Permits for transportation of asbestos waste and location of landfill.
  - .2 Names and credentials of supervisory personnel.
  - .3 Proof in the form of a certificate that supervisory personnel have attended a training course on asbestos removal.
  - .4 Proof with references that supervisory personnel have supervised at least five other asbestos removal projects.
  - .5 Proof that workers have received WHMIS training.
  - .6 Work Place Safety and insurance Clearance Certificates.
  - .7 Proposed schedule including all stages of work.

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- .8 Shop drawings for each Work Area detailing waste and worker decontamination facilities, platform and hoarding layouts, location of negative air discharge panels, Material Safety Data Sheets for chemicals or materials used in the course of the project.
- .9 Negative air unit performance data and results of D.O.P. tests as required.
- .10 Certificate proving that each worker on site has been fit tested for the respirator appropriate for the work being performed.
- .11 Pre-removal survey of damage in all areas where asbestos abatement will take place or waste will be transported.

## 2.5 Worker Protection

- .1 Prior to commencing work instruct workers in all aspects of work procedures and protective measures.
- .2 Provide workers with personally issued marked respiratory equipment acceptable to the Occupational Health and Safety Division of the Ontario Ministry of Labour, suitable for the Asbestos exposure.
- .3 Ensure that suitable respiratory protective equipment is worn by every worker who enters the Asbestos Work Area. A respirator provided by an employer and used by a worker shall be:
  - .1 A non-powered reusable air purifying dust respirator or better, equipped with High Efficiency Particulate Aerosol (HEPA) Filters suitable for asbestos-containing dust.
  - .2 Fitted so that there is an effective seal between the respirator and the worker's face;
  - .3 Assigned to a worker for the worker's exclusive use;
  - .4 Used and maintained in accordance with the procedures specified by the equipment manufacturer;
  - .5 Cleaned, disinfected and inspected after use on each shift, or more often if necessary;
  - .6 Free of damaged or deteriorated parts replaced prior to being used by a worker;
  - .7 Be stored in a convenient, clean and sanitary location; when not in use;
  - .8 Certified by the US National Institute for Occupational Safety and Health (NIOSH) or the British Standards Institution for exposure to airborne asbestos fibre.
- .4 Protective Clothing:
  - .1 Provide workers with full body disposable coveralls. Full body disposable type coveralls shall be:

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- .1 worn by every worker who enters the work area,
- .2 made of a material which does not readily retain nor permit penetration of asbestos fibres,
- .3 full body covering including head covering with snug fitting cuffs at the wrists, ankles and neck,
- .4 include suitable footwear,
- .5 repaired or replaced if torn.
- .2 Provide other body protection required under applicable safety regulations.
- .3 Do not eat, drink, smoke or chew except in established locations outside the Asbestos Work Area.
- .4 Personnel must be fully protected at all times when possibility of disturbance of asbestos exists.
- .5 Provide and post the procedures described under Worker Protection.
- .5 Asbestos Abatement Work Area Entry Procedures
  - .1 Use asbestos abatement precautions at all times when possibility of disturbance of ACM exists.
  - .2 Put on respirator with new or tested filters, coveralls and head covers before entering contaminated Asbestos Work Area. Protective coveralls shall cover all hair and any re-usable clothing.
- .6 Asbestos Abatement Work Area Exit Procedures
  - .1 Remove gross contamination from protective clothing using HEPA vacuum or wet wiping.
  - .2 Remove all contaminated clothing and equipment except respirator.
  - .3 Exit site and proceed to wash area while wearing respirator.
  - .4 Wash exposed skin and respirator with soap and water.
  - .5 Remove respirator filters from respirator. Cover inlet side of respirator with tape for storage and re-use or dispose of as asbestos waste.

## **2.6 Visitor Protection**

- .1 Provide clean protective clothing and equipment and approved respirators to Authorized Visitors.
- .2 Ensure Authorized Visitors have received required training for entry into Asbestos Work Area.

## **2.7 Air Monitoring**

- .1 Air monitoring will be performed following the National Institute for Occupational Safety and Health method 7400.

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- .2 The contractor shall cooperate fully with the asbestos abatement consultant in the collection of air monitoring samples, including the collection of personal worker samples.
- .3 Results of PCM samples of 0.05 fibres per millilitre of air (fibre/mL) or greater, outside of Asbestos Work Area, will indicate asbestos contamination of these areas. The contaminated areas shall be isolated and cleaned in the same manner applicable to the Asbestos Work Area, at no cost to the Owner.

## **PART 3 – EXECUTION**

### **3.1 Preparation Prior to Contamination**

- .1 Moving of equipment, tools, supplies, and stored materials which can be performed without disturbing ACM will be performed by this contractor.
- .2 Disable air handling system affecting Asbestos Work Area. The air handling system shall not be enabled until completion of work.
- .3 Erect polyethylene hoarding walls between Occupied Area and Work Area to create the Asbestos Work Area Enclosure. Support polyethylene sheeting enclosures as required or as directed by Asbestos abatement Consultant.
- .4 Seal all below ceiling openings to work area using polyethylene, tape, caulking, etc.
- .5 Install temporary lighting as required in Asbestos Work Area Enclosure.
- .6 Cover wall surfaces and other articles inside enclosure or forming the enclosure with polyethylene sheeting.
- .7 Establish negative pressure in Asbestos Work Areas as follows:
  - .1 Distribute negative air filter/fan units evenly around the Asbestos Work Area. Negative air pressure system to operate continuously until final completion of the work, including final cleanup. Exhaust air to the outside of the building using sealed ducting. Replace pre-filters and HEPA filters as required and on a regular basis to maintain even and constant draw across negative air unit. Do not discharge negative air ducting with-in 25 feet of building access points.
  - .2 Do not discharge negative air units into Occupied Areas unless specified or with written approval from Asbestos Consultant.
  - .3 For small work areas, the use of a HEPA filtered vacuum may be used for negative pressure. Obtain approval from Abatement Consultant.
- .8 Post signs at doorways leading into a contaminated area. Such signs shall read:

**CAUTION**

***Asbestos Hazard Area  
No Unauthorized Entry  
Wear assigned protective equipment  
Breathing asbestos dust may cause serious bodily harm***

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### **3.2 Asbestos Removal**

- .1 Before beginning work remove visible dust from surfaces in the Work Area. Use HEPA vacuum, or damp cloths where damp cleaning is considered more appropriate. The use of compressed air is strictly forbidden.
- .2 Wet materials containing asbestos to be removed, disturbed, or sealed, with amended water. Use garden type low velocity fine mist sprayer. Perform work in a manner to reduce the creation and spread of dust. Keep material wetted as work proceeds and as additional layers of material are exposed.
- .3 Place waste directly into waste disposal bags. Wherever possible, asbestos-containing material should be removed in sections as intact as possible. Do not allow material to fall to floor.
- .4 Frequently during the work and immediately after completion of the work, clean up dust and waste containing asbestos using a HEPA vacuum.
- .5 Double bag all waste as it is taken out of the Asbestos Work Area Enclosure.
- .6 Clean the entire Asbestos Work Area by means of HEPA vacuuming or wet wiping when removal of ACM is complete.
- .7 Wash and clean or place in 6-mil polyethylene bags, all re-usable tools and equipment used in the removal process.
- .8 Apply a heavy coat of sealant using a fine mist sprayer to all surfaces in the work area.
- .9 The Enclosure shall remain erected until the sealant has dried or, if required, until an air sample is collected inside the enclosure, and the levels are below 0.05 f/cc.

### **3.3 Teardown of Enclosure**

- .1 Carefully roll polyethylene toward the centre of enclosure. Remove visible debris by means of HEPA vacuum as polyethylene is rolled away.
- .2 Place materials used to form Enclosure, disposable coveralls, and other contaminated waste in asbestos waste bags for disposal. All waste is to be double bagged and independently sealed.

### **3.4 Waste and Material Handling**

- .1 Ensure ACM or asbestos-contaminated materials removed during work are treated, packaged, transported and disposed of as asbestos waste.
- .2 Ensure redundant non-ACM, rubble, debris, etc. removed during contaminated work are treated, packaged, transported and disposed of as asbestos contaminated waste.
- .3 Wash and seal non-porous materials prior to disposal as clean waste. Perform only with written approval from the Asbestos Abatement Consultant.
- .4 Clean up visible materials from waste routes and loading area after each load. Use Type 2 Asbestos Abatement Procedures for clean-up of dust and friable materials, or if requested by Owner's Representative.
- .5 Drop garbage bins at designated locations. Keep bins covered and enclosed while at the site. Bin loading area shall be kept clean at all times.



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- .6 Pick-up and drop off of garbage bin shall be at pre-approved times, and must not interfere with the Owners operations.
- .7 Transport asbestos contaminated waste to landfill licensed by Ontario Ministry of Environment and Energy.
- .8 Complete Shipping Document as required by the Transportation of Dangerous Goods Act.
- .9 Cooperate with Governing Authorities and immediately carry out instructions for remedial work at dump to maintain environment, at no additional cost to Owner.

**END OF SECTION**

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## **PART 1 – GENERAL**

### **1.1 General and Related Work**

- .1 All Sections of the Specifications Package form a part of the Contract Documents and shall be read entirely to determine their effect upon the work of this Section. Read this section in conjunction with all other sections so as to comply with the requirements of the General Conditions of the Contract.
- .2 The Specification Package fulfils the requirements of the “Report” in accordance with R.R.O. 2005, Reg. 278 Section 10.
- .3 Related work specified elsewhere:

Division 1	Section 01 35 33	Infection Prevention and Control
Division 2,	Section 02 82 00	Asbestos Abatement – Scope and Details
Division 2,	Section 02 82 20	Type 2 Asbestos Abatement
- .4 It is the intent that work performed as per this Section will result in the removal and disposal of all ACM specified for removal and the decontamination of all materials that have been contaminated by asbestos during work of this Section.

### **1.2 Site Conditions**

- .1 Refer to Section 02 82 00, Scope and Details for Site Conditions.

### **1.3 Outline of Work**

- .1 Refer to Section 02 82 00, Scope and Details for Outline of Work.

### **1.4 Schedule**

- .1 Refer to Section 02 82 00, Scope and Details for Schedule.

## **PART 2 – PRODUCTS**

### **2.1 Materials and Equipment**

- .1 Airless Sprayer: Spray equipment for amended water: for application to asbestos-containing materials for saturation prior to removal. Airless spray units are only acceptable, such as Grace Hydrospray or approved equal.
- .2 Asbestos Waste Containers: Waste shall be contained in two separate containers which shall be dust-tight and impervious to asbestos and any chemicals used during the removal process. The inner container shall be a sealable polyethylene bag (or where the Glove Bag method is used, the Glove Bag itself). Where there are sharp objects included in the waste material, the outer container shall be a sealable fibre type drum, otherwise the outer container may either be a sealable polyethylene bag. Containers shall be as follows:

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- .1 Polyethylene Waste Bag: 0.15 mm (6 mil) thick leak-tight polyethylene bags labelled as required by sub-section 3.5 Waste Disposal.
- .2 Fibre Drums: 55 US gallon capacity heavy duty leak tight fibre drums with tight sealing locking metal top and metal bottom.
- .3 Labels: Waste containers shall have a pre-printed cautionary asbestos warning label, acceptable to local dump authorities, clearly visible when ready for removal to disposal site.
- .3 Caulking: One component non-staining acrylic polymer sealant to conform to GSB Specification 19GP-5M.
- .4 Drop Sheets: In polyethylene type and size appropriate for the work being performed.
- .5 Electrical Power Cords: Use only grounded extension cords; use "hard-service" cords where exposed to abrasion and traffic. Use single lengths or use waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas of work.
- .6 Encapsulant: Type 1 penetrating Class A water based encapsulant conforming to CGSB 1-GP-205M and approved by the Fire Marshall having flame spread and smoke development ratings both less than fifty (50). Acceptable products: Ocean 666, Decadex Fire Check equivalent or better.
- .7 Fine Atomizing Spray Nozzle: Nozzle for airless sprayer capable of delivering not less than 1 gallon per minute of fine particle spray of amended water.
- .8 Fire Extinguishers: Provide Type "A" fire extinguishers for temporary offices and similar spaces where there is minimal danger of electrical or grease-oil-flammable liquid fires. In other locations provide type "ABC" dry chemical extinguishers, or a combination of several extinguishers of NFPA recommended types for the exposures in each case.
- .9 First Aid Supplies: Comply with governing regulations and recognized recommendations within the construction industry.
- .10 Flame-Resistant Polyethylene Sheeting: A single polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-Resistant Textiles and Films, 0.15 mm (6 mils) thickness.
- .11 Foam: Low density polyurethane expanding foam Froth-Pack or equivalent or better.
- .12 Garden Sprayer: A hand pump type pressure-can garden sprayer fabricated out of either metal or plastic, equipped with a metal wand at the end of a hose that can deliver a stream or fine spray of liquid of amended water under pressure.
- .13 Ground Fault Panel: Electrical panel, installed by licensed electrician and equipped as follows:
  - .1 Ground fault circuit interrupters of sufficient capacity to power temporary electrical equipment and lights in Asbestos Work Area.
  - .2 Interrupters to have a 5 mA ground fault protection.
  - .3 Necessary accessories including main switch disconnect, ground fault interrupter lights, test switch to ensure unit is working, and reset switch.
  - .4 Openings sealed to prevent moisture or dust penetration.

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- .14 HEPA Vacuum: Vacuum with necessary fittings, tools and attachments. Discharged air must pass through a HEPA filter.
- .15 Lock-down Agent: Sealant for purpose of trapping residual dust. Product must have flame spread and smoke development ratings both less than 50. Product shall leave no stain when dry. Lock-down agent shall be compatible with replacement insulation or fireproofing where required and capable of withstanding service temperature of substrate.
- .16 Negative Air Unit: Portable air handling system which extracts air directly from the Asbestos Work Area and discharges the air to the exterior of the Asbestos Work Area. Equipped as follows:
  - .1 Prefilter and HEPA filter. Air must pass HEPA filter before discharge.
  - .2 Pressure differential gauge to monitor filter loading.
  - .3 Auto shut off and warning system for HEPA filter failure.
  - .4 Separate hold down clamps to retain HEPA filter in place during change of prefilter.
- .17 Polyethylene Sheeting: A single polyethylene film, 0.15 mm (6-mil) minimum thickness unless otherwise specified.
- .18 Power Washer: Spray equipment for saturation of asbestos-containing material with amended water for cleaning of surfaces in abatement work area after asbestos removal, capable of delivering an airless stream of water at a pressure of not less than 1200 psi or exceeding 2500 psi.
- .19 Protective Coveralls: Disposable full body coveralls complete with hoods manufactured of a material which does not permit penetration of asbestos fibres.
- .20 Rip Proof Polyethylene Sheeting: Woven fibre reinforced fabric bonded both sides with polyethylene sheeting. 0.20 mm (8 mil) fabric made up from 0.13 mm (5 mil) weave and 2 layers 0.04 mm (1.5 mil) poly laminate.
- .21 Scaffolding: The type, erection and use of all scaffolding shall comply with all applicable OSHA provisions.
- .22 Sealer: Slow-drying sealer shall be a non-staining, clear, water dispersible type that remains tacky on the surface for a minimum of 8 hours for the purpose of trapping any residual airborne fibres during the settling period. The product must have flame spread and smoke development ratings both less than 50 and shall leave no stain when dry. Acceptable products: Borden Polyco 804, Double AD TC-55, equivalent or better. (Also referred to as "Lockdown Agent").
- .23 Shower: General shower shall be of the walk-through type to permit use by one person at a time.
  - .1 **Shower Enclosure**: Shower enclosure shall be of a minimum 24 gauge steel walls with baked enamel, galvanized steel, aluminium or stainless steel finish, 16 gauge floor with porcelain enamel finish, brass drain and tapping for mixing valve. Shower installation shall be complete with globe valve for tempered water with a shower head complete with orifice to restrict the flow to 2.5 USGPM.

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- .2 **Shower Pan:** Provide one piece waterproof shower pan of minimum size 4' x 8' by 6" deep. Fabricate from seamless fibreglass minimum 1/16" thick reinforced with wood, 18 ga. stainless or galvanized steel with welded seams or, copper or lead with soldered seams.
- .3 **Shower Head and Controls:** Provide a factory-made shower head producing a spray of water which can be adjusted for spray size and intensity. Feed shower separately with water from hot and cold supply lines. Arrange so that control of water temperature, flow rate, and shut off is from inside shower without outside aid.
- .4 **Hose Bib:** Provide heavy bronze angle type with wheel handle, vacuum breaker, and 3/4" National Standard male hose outlet.
- .5 **Filters:** Provide multi-stage cascaded filter units on drain lines from showers or any other water source carrying asbestos-contaminated water from the work area. Provide units with disposable filter elements where the primary filter passes particle 20 microns and smaller and the final filter passes particles 5 microns and smaller. Connect so that discharged water passes primary filter and output of primary filter passes through secondary filter.
- .24 **Spray Cement:** Spray adhesive in aerosol cans which is specifically formulated to stick tenaciously to sheet polyethylene.
- .25 **Sump Pump:** Provide totally submersible waterproof sump pump with integral float switch and shall have a manual switch. Provide unit sized to pump 2 times the flow capacity of all showers or hoses supplying water to the sump, through the filters specified herein when they are loaded to the extent that replacement is required. Provide unit capable of pumping debris, sand, plaster or other materials washed off during decontamination procedures without damage to mechanism of pump.
- .26 **Tape:** Reinforced cloth or fibreglass reinforced tape in 2" or 3" widths suitable for sealing polyethylene sheeting under both wet conditions using amended water, and dry conditions.
- .27 **Temporary Lighting:** Provide general service incandescent lamps or fluorescent lamps of wattage required for adequate illumination as required by the work. Protect lamps with guard cages grounded together to distribution panel or tempered glass enclosures.
- .28 **Water Heater:** ULC rated electric water heater appropriately sized for project to supply hot water for the Decontamination Unit shower. Activate from ground fault panel. Provide with relief valve compatible with water heater operation; pipe relief valve down to drip pan on floor with rigid piping. Drip pans shall consist of a 12" x 12" x 6" deep pan, made of 19 gauge galvanized steel, with handles.
- .29 **Wetting Agent:** Non-sudsing surface active agent. Acceptable product Aqua-Gro or approved equal.

## 2.2 Regulations

- .1 Comply with Federal, Provincial, and local requirements pertaining to asbestos, provided that in any case of conflict among those requirements or with these specifications the more stringent requirement shall apply. The regulations shall include but not be limited to the following:

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- .1 Ontario Ministry of Labour, Occupational Health and Safety Division, Regulation Respecting Asbestos on Construction Projects and in Buildings and Repair Operations, O.Reg. 278/05.
- .2 Ontario Ministry of the Environment Regulation 347, under the Environmental Protection Act.
- .3 Government of Canada Regulations respecting the Handling, Offering for Transport and Transporting of Dangerous Goods. (Extract from the Canada Gazette Part II, dated February 6, 1985).
- .4 Regulations for Construction Projects O.Reg. 213/91.
- .5 Office of the Fire Commissioner of Canada.
- .6 Ontario Hydro Electrical Safety Code.
- .7 Ontario Occupational Health and Safety Act RSO 1990 c0.1 as amended.
- .8 WHMIS Regulations RRO 1990 Reg. 860.

### **2.3 Notification**

- .1 Notify the Ministry of Labour, Construction Health and Safety Branch, as per R.R.O. 2005, Reg. 278 as amended by O. Reg. 510/92, for Type 3 removal work.
- .2 Notify Sanitary Landfill site as per Ontario Regulation 347.
- .3 Inform all sub trades of the presence of friable ACM identified in the site conditions.
- .4 Notify immediately Ontario Ministry of Labour, as required by Regulation 278 as amended by O. Reg. 510/92, Section 7, if friable materials not identified in the site conditions are discovered during the project.

### **2.4 Submittals**

- .1 Submit prior to starting work:
  - .1 Permits for transportation of asbestos waste and location of landfill.
  - .2 Names and credentials of supervisory personnel.
  - .3 Proof in the form of a certificate that supervisory personnel have attended a training course on asbestos removal.
  - .4 Proof with references that supervisory personnel have supervised at least five other asbestos removal projects.
  - .5 Proof that workers have received WHMIS training.
  - .6 Work Place Safety and insurance Clearance Certificates.
  - .7 Proposed schedule including all stages of work.
  - .8 Shop drawings for each Work Area detailing waste and worker decontamination facilities, platform and hoarding layouts, location of negative air discharge panels, Material Safety Data Sheets for chemicals or materials used in the course of the project.
  - .9 Negative air unit performance data and results of D.O.P. tests as required.

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- .10 Certificate proving that each worker on site has been fit tested for the respirator appropriate for the work being performed.
- .11 Pre-removal survey of damage in all areas where asbestos abatement will take place or waste will be transported.
- .12 Ministry of Labour Notice of Project form.

## 2.5 Worker Protection

- .1 Prior to commencing work instruct workers in all aspects of work procedures and protective measures.
- .2 Provide workers with personally issued marked respiratory equipment acceptable to the Occupational Health and Safety Division of the Ontario Ministry of Labour, suitable for the Asbestos exposure.
- .3 Ensure that suitable respiratory protective equipment is worn by every worker who enters the Asbestos Work Area. A respirator provided by an employer and used by a worker shall be:
  - .1 A full-face non-powered reusable air purifying dust respirator or better, equipped with High Efficiency Particulate Aerosol (HEPA) Filters suitable for asbestos-containing dust for Type 3 Operations where the asbestos-containing materials are wetted and where sprayed asbestos is present, the spray material only contains chrysotile asbestos;
  - .2 Use Type C, pressure demand supplied air respirators with full face piece and egress filters suitable for sprayed asbestos that is of a type other than chrysotile and is wetted;
  - .3 Fitted so that there is an effective seal between the respirator and the worker's face;
  - .4 Assigned to a worker for the worker's exclusive use;
  - .5 Used and maintained in accordance with the procedures specified by the equipment manufacturer;
  - .6 Cleaned, disinfected and inspected after use on each shift, or more often if necessary;
  - .7 Free of damaged or deteriorated parts replaced prior to being used by a worker;
  - .8 Be stored in a convenient, clean and sanitary location when not in use;
  - .9 Certified by the US National Institute for Occupational Safety and Health (NIOSH) or the British Standards Institution for exposure to airborne asbestos fibre.
- .4 Protective Clothing:
  - .1 Provide workers with full body disposable coveralls. Full body disposable type coveralls shall be:
    - .1 Worn by every worker who enters the work area,

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- .2 Made of a material which does not readily retain nor permit penetration of asbestos fibres,
- .3 full body covering including head covering with snug fitting cuffs at the wrists, ankles and neck,
- .4 Include suitable footwear,
- .5 Repaired or replaced if torn.
- .2 Provide other body protection required under applicable safety regulations.
- .3 Do not eat, drink, smoke or chew except in established locations outside the Asbestos Work Area.
- .4 Personnel must be fully protected at all times when possibility of disturbance of asbestos exists.
- .5 Provide and post in Clean Change Room the procedures described under Worker Protection.
- .5 Work Area Entry Procedures
- .1 Personnel and Authorized Visitors are to use the following procedures to enter contaminated Asbestos Work Area:
  - .1 Remove all clothing including undergarments and footwear in Clean Change Room.
  - .2 Put on respirator with new or tested filters, and coveralls in Clean Change Room.
  - .3 Store all street clothes, uncontaminated footwear, towels, etc. in the Clean Change Room.
- .6 Work Area Exit Procedures
- .1 Personnel and Authorized Visitors are to use the following procedures to exit contaminated Asbestos Work Area:
  - .1 Remove visible contamination from protective clothing using HEPA vacuum or by wet wiping.
  - .2 Proceed to Equipment and Access Room and remove all contaminated clothing and equipment except respirator.
  - .3 Store contaminated footwear, hard hats, etc. in Equipment and Access Room.
  - .4 Proceed naked to showers while still wearing respirator.
  - .5 Shower, cleaning outside of respirator with soap and water. Thoroughly wet body, head and hair, remove respirator and wash body, head and hair. Wet clean inside and outside of respirator face piece.
  - .6 Remove filters for testing or dispose as asbestos waste. Remove prior to entering the Clean Change Room.
  - .7 Cover openings on filters to be re-used with duct tape prior to entering the clean area.
  - .8 Proceed to the Clean Change Room, dry off and dress in street clothing.



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## **2.6 Visitor Protection**

- .1 Provide clean protective clothing and equipment and approved respirators to Authorized Visitors.
- .2 Ensure Authorized Visitors have received required training for entry into Asbestos Work Area.

## **2.7 Air Monitoring**

- .1 Air monitoring will be performed following the National Institute for Occupational Safety and Health Method 7400 if required.
- .2 The contractor shall cooperate fully with the Consultant in the collection of air monitoring samples, including the collection of personal worker samples.
- .3 Results of PCM samples of 0.05 fibres per millilitre of air (fibre/mL) or greater, outside of Asbestos Work Area, will indicate asbestos contamination of these areas. The contaminated areas shall be isolated and cleaned in the same manner applicable to the Asbestos Work Area, at no cost to the Owner.
- .4 Clearance air monitoring samples (if required) will be collected after a suitable settling period following application of lock-down agent. Clearance levels must be less than 0.01 fibre/mL for the Work Area to be deemed clean.

## **PART 3 – EXECUTION**

### **3.1 Preparation Prior to Contamination**

- .1 Moving of equipment, tools, supplies, and stored materials which can be performed without disturbing ACM will be performed by this contractor.
- .2 Install Worker Decontamination Facility. Worker Decontamination Facility shall comprise of an Equipment and Access Room, a Shower Room, and a Clean Room, as follows:
  - .1 **Equipment and Access Room:** build an Equipment and Access Room between Shower Room and work areas, with two air locks, one to the Shower Room and one to work areas. The Equipment and Access Room shall be large enough to accommodate the storage of work boots, or any other protective clothing that might be used again, and at least three workers allowing them sufficient space to undress comfortably.
  - .2 **Shower Room:** build a Shower Room between the Clean Room and Equipment and Access Room, with two air locks, one to the Clean Room and one to Equipment and Access Room. Provide a constant supply of hot and cold water. The Shower Room shall have individual controls inside the room to regulate water temperature and flow. Provide piping and connect to water sources and drains. Pump waste water through a 5-micrometre filter system acceptable to Consultant before directing into drains. Provide soap, clean towels and appropriate containers for disposal of used respirator filters.

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- .3 **Clean Room:** build a Clean Room between the Shower Room and clean areas outside of enclosures, with two air locks, one to outside of enclosures and one to Shower Room. Provide lockers or hangers for workers' street clothes and personal belongings. Provide storage for clean protective clothing and respiratory equipment. Install a mirror to permit workers to fit respiratory equipment properly, and sufficient hangers and hooks.
- .4 Construct Decontamination Enclosures as follows:
  - .1 Build suitable framing for enclosures, and line with polyethylene sheeting sealed with tape. Framing shall be constructed of 2" x 4" studs (stud grade) at 24" O.C (max.) with 2" x 4" wood sill and top plates (stud grade) fastened with a minimum of two 3 1/2" common nails per stud end. Use one layer of rip-proof polyethylene on floors, and 2 layers of rip-proof polyethylene on floors. Use 2 layers of opaque rip-proof polyethylene sheeting on walls and ceiling: an inner layer made up of 6 mil poly, and an outer layer made up of rip-proof polyethylene.
  - .2 Build weighted overlapping orange rip-proof poly curtained doorways between chambers.
- .5 Provide a minimum of one layer of rip-proof polyethylene on all Work Area perimeter walls.
- .6 Protect remaining perimeter walls, fixtures, contents, etc. with a minimum of one (1) layer of 6 mil polyethylene sheeting.
- .3 Provide hoarding walls consisting of 2 layers of rip-proof polyethylene sheeting supported by wood or metal studs as required between Type 3 Asbestos Work Areas and other areas of the building.
- .4 Supply water as required for Asbestos Work Area and Decontamination Facilities. Water will be supplied by the Owner from existing potable water system. Contractor is responsible for all fittings. Contractor shall install using vacuum breakers or other backflow preventer as required by local authority.
  - .1 Water supply shall be by means of flex hose pipe and fittings on high-pressure hose and fittings. A master shut-off valve shall be installed adjacent to, and on the clean side, of the decontamination facility. Any hose and hose connections must be for high pressure only and downstream of the master shut-off valve and is not to be left under pressure unattended. Maintain hose connections and outlet valves in leakproof condition. Where finish work below an outlet might be damaged by spillage or leakage, provide a drip pan of suitable size to minimize the possibility of water damage. Drain water promptly from pans as it accumulates.
- .5 Provide and install drainage facilities from temporary shower.
- .6 Provide and install drainage in removal work areas as required.
- .7 Provide and install a filtration system to filter all water to be disposed of from the removal and decontamination area.
- .8 Pre-clean all surfaces in the Asbestos Work Area, using a HEPA vacuum or damp cloth prior to installing protection.

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- .9 Remove fixtures, equipment etc. specified to be removed, and that can be removed without disturbing ACM.
- .10 Fire alarms, heat detectors, and smoke detectors will be deactivated.
- .11 Seal all below ceiling openings to Asbestos Work Area using polyethylene, tape, caulking, etc., including but not limited to windows, doors, vents, diffusers, etc.
- .12 Seal all openings in floor using plugs, tape, caulking, rip-proof polyethylene, etc. Include floors of duct and service shafts.
- .13 Maintain emergency and fire exits from work areas, or establish alternative exits satisfactory to Fire Commissioner of Canada and Provincial Fire Marshall.
- .14 Provide a fire extinguisher at each emergency exit and in both sides of the Decontamination Facilities.
- .15 Install temporary lighting in all work areas at levels that will provide for a safe and efficient use of the work area. Install battery powered emergency lights so as to Light exit routes through Asbestos Work Area.
- .16 Establish negative pressure in Asbestos Work Areas as follows:
  - .1 Distribute negative air filter/fan units evenly around the Asbestos Work Area. Remove windows and replace with 1/2" plywood with appropriately sized openings for exhaust. Switch the negative air pressure system to the "ON" mode and operate continuously until final completion of the work, including final cleanup. Exhaust air to the outside of the building using sealed ducting. A spare negative air unit will be fully installed and ready to operate as a backup unit. The negative air pressure system must have the capacity to exchange air volume of the work area three times per hour and maintain a minimum of 0.03 inches of water gauge differential. Operate negative pressure system continuously from the time the first polyethylene is installed to seal openings until final completion of the work including final cleanup and air testing. Replace pre-filters and HEPA filters as required and on a regular basis to maintain even and constant draw across negative air unit. Do not discharge negative air ducting with-in 25 feet of building access points. Replace windows removed for discharge panels upon completion of project.
  - .2 Provide negative pressure monitor, which is to operate continuously to measure negative pressure in the Work Area.
  - .3 Do not discharge negative air units into Uncontaminated Areas unless specified or with written approval from Asbestos Consultant.
- .17 Isolate at panel and disconnect or ground existing power supply to Asbestos Work Area where necessary.
- .18 Post signs at locations where access to a sealed Asbestos Work Area is possible. Signs shall be installed at Curtained Doorways leading directly into a contaminated area. Such signs shall read:

**CAUTION**  
**Asbestos Hazard Area**  
**No Unauthorized Entry**  
**Wear assigned protective equipment**

Type 3 Asbestos Abatement

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***Breathing asbestos dust may cause serious bodily harm***

- .19 Do not proceed with work of Ceiling Removal without obtaining written permission from the Asbestos Abatement Consultant. Provide a minimum of 24 hours notice to consultant for the need of an inspection.

**3.2 Asbestos Removal**

- .1 Spray asbestos material with water containing the specified wetting agent, using airless spray equipment capable of providing a "mist" application to prevent release of fibres. Saturate the asbestos material sufficiently to wet it to the substrate without causing excess dripping. Spray the asbestos material repeatedly during work process to maintain saturation and to minimize asbestos fibre dispersion. Score the outer surface where water does not penetrate the outer layers.
- .2 Remove the saturated asbestos material in small sections. Do not allow saturated asbestos to dry out. As it is being removed, pack the material in sealable plastic bags 0.15 mm minimum thick and place in labelled containers for transport. Collect waste water from the floor, do not allow it to pool. Mist the air continuously where asbestos is being disturbed with amended water using one dedicated airless sprayer equipped with a fine atomizing nozzle. If fibre levels exceed 2.0 f/cc, then additional dedicated sprayer(s) will be required as directed by the Asbestos Abatement Consultant. Contain waste water in sealable plastic containers, suitable for transport and disposal without leaking or dispose of by pumping into a settling tank, filtering the water using specified filters, and then pumping into a sanitary sewer.
- .3 Seal filled containers. Clean external surfaces thoroughly by wet sponging. Remove from immediate working area to Staging Area. Clean external surfaces thoroughly again by wet sponging before moving containers to decontamination washroom. Wash containers thoroughly in decontamination washroom, and store in holding room pending removal to unloading room and outside. Ensure that containers are removed from the holding room by workers who have entered from uncontaminated areas dressed in clean coveralls.
- .4 After completion of removal work, all surfaces from which asbestos has been removed shall be wire brushed and wet-sponged to remove all visible material. During this work the surfaces shall be kept wet.
- .5 Where Asbestos Abatement Consultant decides complete removal of asbestos-containing material is impossible due to obstructions such as structural members or major service elements, and provides written direction, seal the material as directed by the Consultant.
- .6 After wire brushing and wet sponging to remove visible asbestos, wet clean the entire work area including the Equipment and Access Room, and equipment used in the process. Pre-filters on fan units shall be treated as asbestos waste and disposed of accordingly.
- .7 Do not proceed with work of applying Lock Down Agent without obtaining written permission from the Asbestos Abatement Consultant indicating a visual clearance inspection has been performed and the site is satisfactory to the Consultant. Provide a minimum of 24-hour notice to consultant for the need of a visual clearance inspection.

Type 3 Asbestos Abatement

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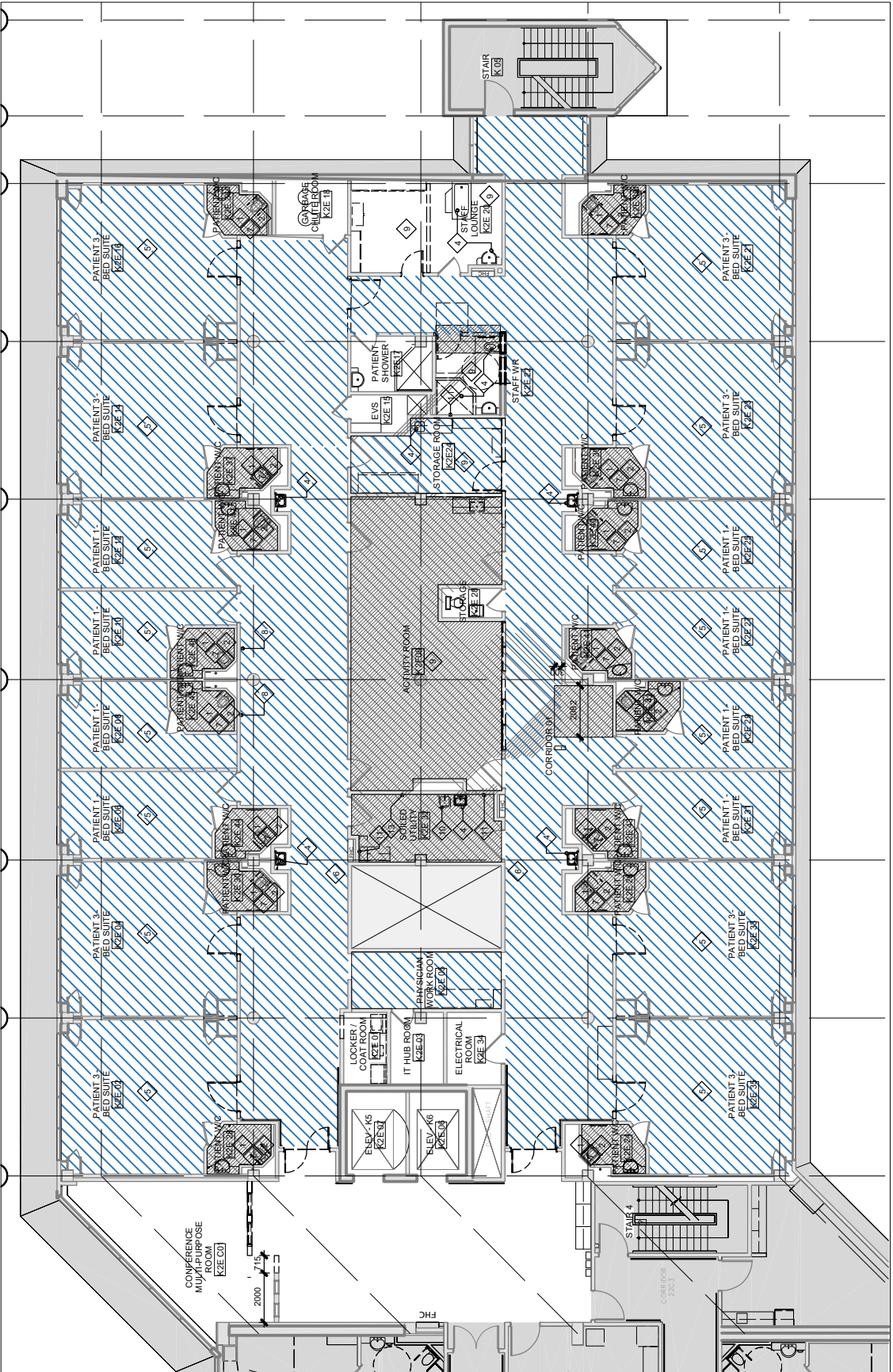
### **3.3 Application of Lock Down Agent**

- .1 After completion of the final cleaning and after the Consultant has passed a visual cleanliness inspection, spray sealant (approved by the Consultant) on all surfaces in the Asbestos Work Area.
- .2 Allow a 24-hour settling period, and for the sealer to dry. During this settling period, no entry or activity will be permitted in the work area.
- .3 Obtain written permission from Consultant to proceed with Asbestos Work Area Tear Down and Dismantling. If other trades or non-abatement workers are to return into the Work Area to conduct additional work, Air Clearance Sampling will be required. Only after acceptable clearance air monitoring results of 0.01 f/mL will the trades be allowed in. Should clearance air monitoring results exceed 0.01 f/mL, the contractor will, at no cost to the owner, reclean the entire Asbestos Work Area and apply another coat of Lock Down Agent.

### **3.4 Asbestos Work Area Teardown And Dismantling**

- .1 Maintain the perimeter seal and Type 3 procedures and use worker decontamination facility.
- .2 Operate negative air units during teardown.
- .3 Remove all polyethylene, tape, polyurethane foam, caulking and enclosures from Asbestos Work Area.
- .4 Remove asbestos contaminated floor polyethylene by carefully rolling away from walls to centre of Asbestos Work Area.
- .5 Remove visible fibres or residue found during removal of polyethylene using a HEPA vacuum.
- .6 Place Polyethylene, tape, cleaning material, clothing and other contaminated waste in asbestos waste containers and dispose of as asbestos waste.
- .7 Seal vacuum hoses and fittings, flexible ductwork and all tools used in contaminated work site in 6 mil polyethylene bags prior to removal from Work Area.
- .8 Wash equipment used in contaminated Asbestos Work Area to remove all asbestos contamination, or double bag for transportation prior to being removed from Asbestos Work Area, via waste and equipment decontamination facility.
- .9 Clean up Asbestos Work Area, Equipment and Access area, washing/Showering Room, and other enclosures that may be contaminated.
- .10 Remove all temporary lights, ground fault panels and Negative Pressure Units.
- .11 Remove negative air unit prefilters and dispose of as asbestos contaminated waste.
- .12 Immediately upon shutting down negative air units, seal air inlet grill and exhaust vent with polyethylene and tape.
- .13 Remove decontamination facilities.
- .14 Damp mop and clean with HEPA vacuum Uncontaminated Areas previously below decontamination facilities with HEPA vacuum.

#### **END OF SECTION**



SCALE

NTS

SHEET

AR-01

DATE:

July, 2025

Asbestos Abatement Drawing

Sunnybrook Health Sciences Centre  
2075 Bayview Ave, North York, ON

K2E & K3E Renovations

Second Floor Plan Floor Plan

LEGEND	
SYMBOL	DESCRIPTION
	REMOVE ACM VINYL SHEET FLOORING REFER TO SECTION 02 82 00.

PROJECT NO.:

22765

Drawn By:

D.SEUJATTAN

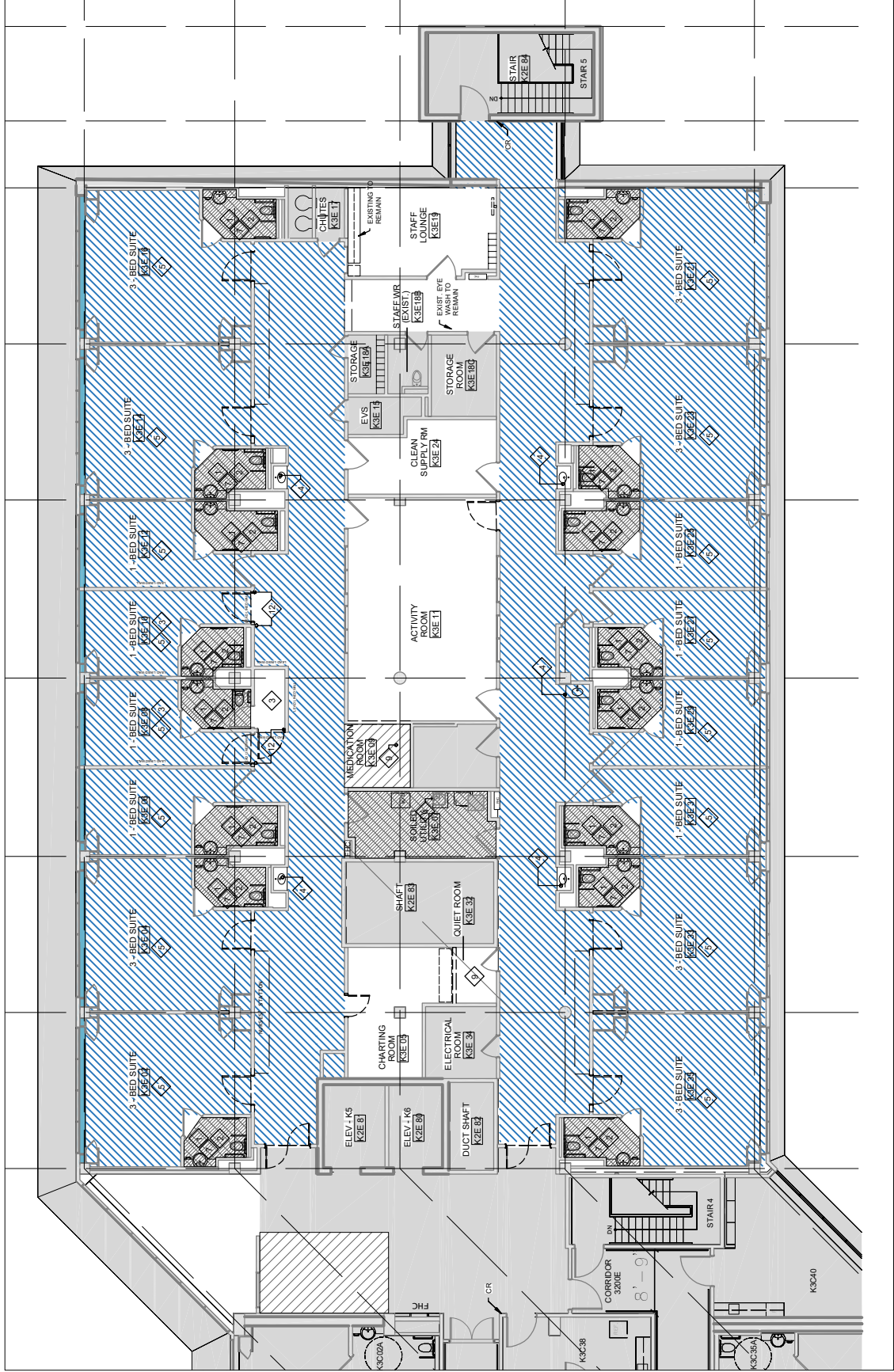
Checked By:

R.REBOKS

MAPLE ENVIRONMENTAL INC.

ENVIRONMENT, HEALTH & SAFETY CONSULTANTS

482 South Service Rd. E. - Suite 116  
Oakville - Ontario - L6J-2X6  
Tel: (905) 257-4408 - Fax: (905) 257-8865  
www.MapleEnvironmental.com



SAMPLE LOCATIONS	
SYMBOL	DESCRIPTION

LEGEND	
SYMBOL	DESCRIPTION
	REMOVE ACM VINYL SHEET FLOORING REFER TO SECTION 02 82 00.

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ISSUED FOR: TENDER

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## **PART 1      GENERAL**

### **1.1      GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.
- 1.1.2 Contractor is solely responsible for dividing the Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of the Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2      SUMMARY**

- 1.2.1 Provide labour, materials, Products, equipment and services to complete the hydraulic cement underlayment work specified herein. This includes, but is not necessarily limited, to:
  - 1.2.1.1 polymer-modified, self-leveling, hydraulic cement underlayment for application below interior floor coverings to achieve slab levelness and flatness requirements required for installation of flooring materials.
  - 1.2.1.2 Auxiliary materials required for a complete installation.
- 1.2.2 Related Requirements: Specifications throughout all Divisions of the Project shall be read as a whole, and may be directly applicable to this Section.

### **1.3      REFERENCES**

- 1.3.1 Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply. Refer to 01 42 00 - Reference.

### **1.4      MEASUREMENT AND PAYMENT**

- 1.4.1 Provision for hydraulic cement underlayment specified on this Section is based on a fixed price for installation of specified product at thickness of **10 mm (3/8 inch)**. Such cost must be included in Contract Price.
- 1.4.2 Unit Prices: Offer following unit prices for Owner's consideration and ensure such are marked appropriately on Bid Form:
  - 1.4.2.1 Hydraulic Cement Underlayment: cost to supply and install underlayment specified herein calculated per cubic meter (cu. ft) to address substrate deflection, surface irregularities, and ensure a flat and level surface suitable for application of specified flooring materials.

### **1.5      PREINSTALLATION MEETINGS**

- 1.5.1 Project Meetings, generally: in accordance with Section 01 31 19, Project Meetings.



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- 1.5.2 Pre-installation Meetings: Schedule and hold a pre-installation meeting at the Project site at least one week before beginning work on this Section to coordinate activities with related Subcontractors.
  - 1.5.2.1 Required Attendance: Subcontractor performing work of this Section, representatives from manufacturers and fabricators involved in or affected by installation.
  - 1.5.2.2 Notification: Notify Consultant and Owner of scheduled meeting dates in advance; minimum 72 hour notice required.
  - 1.5.2.3 Agenda:
    - .1 Review progress of related construction activities and preparations for particular activity under consideration.
    - .2 Make note of required sequencing and coordination with materials and activities that have preceded or will follow.
    - .3 Review of substrate types, compatibility, substrate moisture testing, substrate texture, concrete surface profile (CSP), surface porosity, and flatness as well as environmental requirements for installation of hydraulic cement underlayment.
    - .4 Review of minimum and maximum thickness of hydraulic cement underlayment that can be installed, noting that unacceptable substrate levels must be corrected.
    - .5 Review of flooring finishes that must be applied subsequently and installation requirements of such floor finishes.
  - 1.5.2.4 Reporting: Record significant discussions, agreements, and disagreements, including required corrective measures and actions.
  - 1.5.2.5 Distribution: Distribute minutes of the meeting to each party present and to other parties requiring information not more than 72 hours after meeting.

## **1.6 SUBMITTALS**

- 1.6.1 Submittals, generally: in accordance with Section 01 33 00, Submittal Procedures.
- 1.6.2 Product Data: Submit manufacturer's product characteristics, catalogue cuts, installation instructions and other relevant information for each material and product used for hydraulic cement underlayment work specified in this Section.
- 1.6.3 Qualification Data: Provide written documentation from manufacturer confirming that installer meets qualifications as specified and is eligible for manufacturer's warranty.
- 1.6.4 Embodied Carbon / Environmental Product Declarations (EPDs): When available, submit product-specific or industry-wide EPDs conforming to ISO 14025 or other recognized environmental Product declaration framework meeting following criteria:
  - 1.6.4.1 EPD Scope: Must cover Cradle-to-Gate (A1 to A3) as a minimum.

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- 1.6.4.2 EPD Impact Categories: Must report Global Warming Potential (GWP) in form of unit of kgCO<sub>2</sub>e/declared unit as a minimum.
- 1.6.4.3 Product Options: Give preference to Products with compliant documentation when choice is at Contractor's option.
- 1.6.5 Material Ingredient Disclosure: When available, submit documentation disclosing chemical inventory of materials to at least 0.1% (1000ppm) meeting following criteria:
  - 1.6.5.1 Standard: Health Product Declaration (HPD) Open Standard, Cradle to Cradle v2 (Basic level) or Cradle to Cradle v3 (Bronze level), International Living Future Institute (ILFI) Declare, or other approved material ingredient declaration framework.
  - 1.6.5.2 Product Options: Give preference to Products with compliant documentation when choice is at Contractor's option.
- 1.6.6 Low-Emitting Materials: For applicable Products specified or used for activities of this Section (i.e., site-applied coatings, adhesives, and sealants), submit certifications from third-party organizations indicating compliance with following:
  - 1.6.6.1 VOC Emissions: California Department of Public Health (CDPH) Standard Method v1.2–2017, using applicable exposure scenario.
  - 1.6.6.2 VOC Content: SCAQMD Rule 1113 (for paints and coatings) and SCAQMD Rule 1168 (for adhesives and sealants).

## **1.7 CLOSEOUT SUBMITTALS**

- 1.7.1 Closeout Submittals, generally: in accordance with Section 01 78 00, Closeout Submittals.
- 1.7.2 Operating and Maintenance Data: Submit care and maintenance instructions for hydraulic cement underlayment to be included in building operation and maintenance manual.
- 1.7.3 Warranty Documentation: Submit copy of extended warranties specified in this Section.

## **1.8 QUALITY ASSURANCE**

- 1.8.1 Manufacturer Qualifications: Provide Products for work of this Section by manufacturer with at least 10 years' experience manufacturing such materials.
- 1.8.2 Installer Qualifications: Engage an entity with sufficient experience in installing work similar in material, design, and extent to that shown in Contract Documents, and whose work has resulted in construction with a track record of successful in-service performance.
- 1.8.3 Single Source Responsibility: Obtain primary materials for this Section from a single source by a single manufacturer, and secondary materials from sources recommended by manufacturers of primary materials.

## **1.9 DELIVERY, STORAGE AND HANDLING**

- 1.9.1 Product Requirements, generally: in accordance with Section 01 61 00, Common Product Requirements.

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- 1.9.2 Deliver, store and handle hydraulic cement underlayment materials in accordance with manufacturer's written instructions.
- 1.9.3 Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- 1.9.4 Store products in a dry area with temperature maintained between 10° and 29°C (50° and 85°F) and protect from direct sunlight.
- 1.9.5 Store materials in off-ground, in clean, dry, well-ventilated area.
- 1.9.6 Replace defective or damaged materials with new.

#### **1.10 FIELD CONDITIONS**

- 1.10.1 Place hydraulic cement underlayments only when ambient temperature and temperature of substrates are between 10 and 29 deg C (50 and 85 deg F). These temperatures must also be maintained during and for 48 hours after the installation of products included in this Section.
- 1.10.2 Do not install material below 10°C (50°F) surface and air temperatures. Maintain such temperatures during installation and for at least 48 hours after installation of products specified in this section.
- 1.10.3 Do not apply if rain is expected within 6 to 8 hours or if freezing temperatures are expected within 24 hours of application. Such conditions may influence aesthetic and functional properties of cementitious materials.
- 1.10.4 Expedite installation on warm substrates and adhere to manufacturer's guidelines for installation in warm weather.

#### **1.11 WARRANTY**

- 1.11.1 Extended warranty: Submit for Owner's review and acceptance, manufacturer's extended warranty in which manufacturer commits to repair or replace components of hydraulic cement underlayment that fail within specified warranty period. Manufacturer's extended warranty is in addition to, and does not supersede, any other rights that Owner may have under Contract Documents.
  - 1.11.1.1 Warranty Period: Not less than 5 years from date of Substantial Performance of The work.

### **PART 2 PRODUCTS**

#### **2.1 MANUFACTURERS**

- 2.1.1 Provided requirements of Contract Documents are satisfied, the following manufacturers may supply Products for work this Section:
  - 2.1.1.1 ARDEX Engineered Cements
  - 2.1.1.2 CPD Construction Products
  - 2.1.1.3 Laticrete
  - 2.1.1.4 MAPEI Corporation
  - 2.1.1.5 Maxxon

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- 2.1.2 Substitution Limitations: In accordance with requirements of Section 01 25 00, Substitution Procedures.

## **2.2 PERFORMANCE / DESIGN CRITERIA**

- 2.2.1 Hydraulic cement underlayments specified in this Section must comply with ASTM C1708.
- 2.2.2 VOC Content and Emissions:
- 2.2.2.1 VOC Emissions: For applicable items in this Section, comply with CDPH Standard Method v1.2–2017 (CA Spec 01350) and ensure products are certified per UL 2818, SCS Global Gold, or equivalent.
- 2.2.2.2 VOC Content Requirements: Wet-applied materials used in scope of this Section must conform to the following:
- .1 Paints and Coatings: SCAQMD Rule 1113 or CARB SCM.
  - .2 Adhesives and Sealants: SCAQMD Rule 1168.
  - .3 Methylene chloride and perchloroethylene must not be intentionally added in paints, coatings, adhesives, or sealants.

## **2.3 HYDRAULIC CEMENT UNDERLAYMENT**

- 2.3.1 Polymer-modified, self-leveling, hydraulic cement product that can be applied in minimum uniform thickness of 6 mm (1/4 inch) and that can be feathered at edges to match adjacent floor elevations.
- 2.3.1.1 Primary Binder: Product must use ASTM C150/C150M or CSA A3000, portland cement, or hydraulic or blended hydraulic cement as defined by ASTM C219. Gypsum-based products are not acceptable.
- 2.3.1.2 Compressive Strength: Not less than 27.6 MPa (4000 psi) at 28 days when tested according to ASTM C109/C109M.
- 2.3.1.3 Underlayment Additive: resilient-emulsion product from underlayment manufacturer, designed for use with underlayment on specified substrate and conditions.
- 2.3.1.4 Basis-of-Design Products: "V1200" by Ardex Engineered Cements.
- .1 Acceptable Equivalents:
- .1 "Level-Right FS 10" by Maxxon Canada
  - .2 "MAPEI Novaplan 2" by Mapei Corporation
  - .3 "Topcrete SL" by CPD Construction Products
- 2.3.1.5 Aggregate: Well-graded, washed gravel, 3 to 9.5 mm (1/8 to 3/8 inch); or coarse sand as recommended by underlayment manufacturer.
- 2.3.1.6 Provide aggregate when recommended in writing by underlayment manufacturer for underlayment thickness required.

## **2.4 AUXILIARY MATERIALS**

- 2.4.1 Primer: Product of underlayment manufacturer recommended in writing for substrate, conditions, and application indicated.

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- 2.4.2 Patching Compound: formulated from a blend of Portland cement and other hydraulic cement
  - 2.4.2.1 Acceptable Products:
    - .1 "Plani/Patch" by Mapei Inc.
    - .2 "Feather Finish" Ardex Engineered Cements.
    - .3 Approved equivalent.
- 2.4.3 Screed mortars: concentrate of additives mixed with sand and gravel, to form fast setting, high strength cement screed in preparation of thick fast-setting screeds or leveling coats, mortar beds, and slopes.
  - 2.4.3.1 Acceptable Products:
    - .1 "Topcem Premix with Planigrout AC," Accelerated Cure thick bed Screed and additive by Mapei Inc.
    - .2 "ARDEX AM100" by Ardex Engineered Cements
    - .3 Approved equivalent.
- 2.4.4 Water: Potable and at a temperature of not more than 21 deg C (70 deg F).
- 2.4.5 Semi-Rigid Joint Sealant for moving joints: As recommended by manufacturer. Provide
- 2.4.6 Joint Filler for Saw Cuts, Control Joints and Dormant Cracks: As recommended by manufacturer.

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION**

- 3.1.1 Verify actual site conditions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.

#### **3.2 PREPARATION**

- 3.2.1 Moisture testing: Test substrates in accordance with ASTM F2170. Rectify moisture-related issues or other conditions that might affect performance of underlayment or final floor covering. Do not proceed with installation until moisture-related issues and other deleterious conditions have been resolved.
  - 3.2.1.1 For areas with moisture vapour emissions beyond those permitted by manufacturer, install moisture control system as specified in Section – Moisture Testing Requirements for Floor Finishes.
- 3.2.2 General: Prepare and clean substrate according to manufacturer's written instructions.
  - 3.2.2.1 Treat nonmoving substrate cracks according to manufacturer's written instructions to prevent cracks from telegraphing (reflecting) through underlayment.

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- 3.2.2.2 Fill substrate voids to prevent underlayment from leaking.
- 3.2.3 Mechanically abrade surfaces to remove laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants in accordance with manufacturer's written instructions and to avoid underlayment bond impairment.
- 3.2.4 Adhesive Residues:
  - 3.2.4.1 Prior to installation over adhesive residues on concrete, test adhesive for water-solubility.
  - 3.2.4.2 Mechanically remove water-soluble adhesives to expose clean concrete.
  - 3.2.4.3 Prepare non-water-soluble adhesives to a thin, firmly-bonded residue using the wet scraping technique, as recommended by Resilient Floor Covering Institute ([www.rfci.com](http://www.rfci.com)).
  - 3.2.4.4 Ensure residue after scraping appears only as a transparent stain on concrete.
- 3.2.5 Metal Substrates: Mechanically remove, according to manufacturer's written instructions, rust, foreign matter, and other contaminants that might impair underlayment bond. Apply corrosion-resistant coating compatible with underlayment if recommended in writing by underlayment manufacturer.
- 3.2.6 Nonporous Substrates: For ceramic tile, quarry tile, and terrazzo substrates, remove waxes, sealants, and other contaminants that might impair underlayment bond, and prepare surfaces according to manufacturer's written instructions.
- 3.2.7 Adhesion Tests: After substrate preparation, test substrate for adhesion with underlayment according to manufacturer's written instructions

### **3.3 APPLICATION**

- 3.3.1 Mix and apply underlayment components according to manufacturer's written instructions.
  - 3.3.1.1 Close areas to traffic during underlayment application and for time period after application recommended in writing by manufacturer.
  - 3.3.1.2 Coordinate application of components to provide optimum adhesion to substrate and between coats.
  - 3.3.1.3 At substrate expansion, isolation, and other moving joints, allow joint of same width to continue through underlayment.
- 3.3.2 Priming: Prime substrates in accordance with manufacturer's instructions for various substrate types; ensure proper application and drying times.
- 3.3.3 Apply underlayment to produce uniform, level surface.
  - 3.3.3.1 Mixing: Mix components in accordance with manufacturer's instructions. Respect proper water-to-product ratio and use appropriate mixing techniques.
  - 3.3.3.2 Apply a final layer without aggregate to product surface.
  - 3.3.3.3 Feather edges to match adjacent floor elevations.

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- 3.3.4 Cure underlayment according to manufacturer's written instructions. Prevent contamination during application and curing processes.
- 3.3.5 Do not install floor coverings over underlayment until after time period recommended in writing by underlayment manufacturer.
- 3.3.6 Remove and replace underlayment areas that show a lack of bond with substrate, including areas that emit a "hollow" sound when tapped

### **3.4 PROTECTION**

- 3.4.1 Protect hydraulic cement underlayment from damage, soiling and contaminating substances resulting from construction activities or caused by work of other trades.
- 3.4.2 Prior to finish flooring installation, protect underlayment surface from abuse by other trades using plywood, Masonite or other protection course acceptable to underlayment manufacturer.
- 3.4.3 Where soiling or spills have occurred, remove spills and soiling from adjacent surfaces using cleaning procedures recommended in writing by affected material's manufacturer. Do not use materials or process that can damage finishes, surfaces, or construction.
- 3.4.4 Promptly replace hydraulic cement underlayment work damaged during construction that cannot be satisfactorily repaired.

### **3.5 THIRD-PARTY INSPECTION AND TESTING**

- 3.5.1 Owner reserves right to execute following procedure during underlayment application:
  - 3.5.1.1 Testing Engagement: Owner may engage a competent inspection and testing agency to evaluate underlayment material during application.
  - 3.5.1.2 Cost of testing: by Owner or via Cash Allowance.
  - 3.5.1.3 Testing Method: ASTM C109, modified to air-cure only.
  - 3.5.1.4 Test results: to be relayed to Owner and Contractor for necessary actions.
  - 3.5.1.5 Non-compliance Action: If materials fail to meet specified requirements, cost for retesting to be at Contractor's expense. Replace, at no extra cost to Owner, Products shown to not be in compliance with requirements of Contract Documents.

**END OF SECTION**

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## **PART 1      GENERAL**

### **1.1      GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.
- 1.1.2 Contractor is solely responsible for dividing the Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of the Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2      SUMMARY**

- 1.2.1 Provide medical equipment support system including but not limited to following:
  - 1.2.1.1 continuous slot, bolted metal framing channel system designed to support medical equipment.
  - 1.2.1.2 structural attachments.
  - 1.2.1.3 associated fittings and hardware
- 1.2.2 Related Requirements: Specifications throughout all Divisions of the Project shall be read as a whole, and may be directly applicable to this Section.

### **1.3      REFERENCES**

- 1.3.1 Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply. Refer to 01 42 00 - Reference.

### **1.4      ADMINISTRATIVE REQUIREMENTS**

- 1.4.1 Project Meetings, generally: in accordance with Section 01 31 19, Project Meetings.
- 1.4.2 Pre-installation Meetings: Schedule and hold a pre-installation meeting at the Project site at least one week before beginning work on this Section to coordinate activities with related Subcontractors.
  - 1.4.2.1 Required Attendance: Subcontractor performing work of this Section, representatives from manufacturers and fabricators involved in or affected by installation.
  - 1.4.2.2 Notification: Notify Consultant and Owner of scheduled meeting dates in advance; minimum 72 hour notice required.
  - 1.4.2.3 Agenda:
    - .1 Review progress of related construction activities and preparations for particular activity under consideration.



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- .2 Make note of required sequencing and coordination with materials and activities that have preceded or will follow.
  - .3 Review of substrate types, compatibility, substrate moisture testing, substrate texture, concrete surface profile (CSP), surface porosity, and flatness as well as environmental requirements for installation of hydraulic cement underlayment.
  - .4 Review of minimum and maximum thickness of hydraulic cement underlayment that can be installed, noting that unacceptable substrate levels must be corrected.
  - .5 Review of flooring finishes that must be applied subsequently and installation requirements of such floor finishes.
- 1.4.2.4 Reporting: Record significant discussions, agreements, and disagreements, including required corrective measures and actions.
- 1.4.2.5 Distribution: Distribute minutes of the meeting to each party present and to other parties requiring information not more than 72 hours after meeting.

## **1.5 SUBMITTALS**

- 1.5.1 Submittals, generally: in accordance with Section 01 33 00, Submittal Procedures.
- 1.5.2 Product Data: Submit manufacturer's literature and data sheets for each type of material provided under this Section for Project. Ensure data sheets provide required information including detailed instructions for installing as well as maintaining, preserving and keeping materials in clean and safe conditions. Provide adequate warning of maintenance practices or cleaning agents detrimental to specified materials.
- 1.5.3 Embodied Carbon / Environmental Product Declarations (EPDs): When available, submit product-specific or industry-wide EPDs conforming to ISO 14025 or other recognized environmental Product declaration framework meeting following criteria:
- 1.5.3.1 EPD Scope: Must cover Cradle-to-Gate (A1 to A3) as a minimum.
  - 1.5.3.2 EPD Impact Categories: Must report Global Warming Potential (GWP) in form of unit of kgCO<sub>2</sub>e/declared unit as a minimum.
  - 1.5.3.3 Product Options: Give preference to Products with compliant documentation when choice is at Contractor's option.
- 1.5.4 Material Ingredient Disclosure: When available, submit documentation disclosing chemical inventory of materials to at least 0.1% (1000ppm) meeting following criteria:
- 1.5.4.1 Standard: Health Product Declaration (HPD) Open Standard, Cradle to Cradle v2 (Basic level) or Cradle to Cradle v3 (Bronze level), International Living Future Institute (ILFI) Declare, or other approved material ingredient declaration framework.
  - 1.5.4.2 Product Options: Give preference to Products with compliant documentation when choice is at Contractor's option.

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- 1.5.5 Low-Emitting Materials: For applicable Products specified or used for activities of this Section (i.e., site-applied coatings, adhesives, and sealants), submit certifications from third-party organizations indicating compliance with following:
  - 1.5.5.1 VOC Emissions: California Department of Public Health (CDPH) Standard Method v1.2–2017, using applicable exposure scenario.
  - 1.5.5.2 VOC Content: SCAQMD Rule 1113 (for paints and coatings) and SCAQMD Rule 1168 (for adhesives and sealants).
- 1.5.6 Shop Drawings: Submit Shop Drawings for the following:
  - 1.5.6.1 Show complete system including plans, sections, and details.
  - 1.5.6.2 Show design loadings including equipment vertical and horizontal loadings.
  - 1.5.6.3 Locate all center point/Iso-centers of equipment off of finished wall lines.
  - 1.5.6.4 Show all manufactured parts by catalog numbers, fabricated parts, fasteners and hardware.
  - 1.5.6.5 Show layout of framing and supports, anchorages, size and spacing of fastenings, reinforcing channels, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.
  - 1.5.6.6 Indicated thicknesses and steel grade of materials and zinc coating designations.
  - 1.5.6.7 Do not commence fabrication prior to Consultant's review of Shop Drawings.
- 1.5.7 Engineering Calculations:
  - 1.5.7.1 Submit structural calculations for all member and connections prepared by a Professional Engineer as specified herein.
  - 1.5.7.2 Provide rational structural analysis with section properties of framing members demonstrated by calculations.
  - 1.5.7.3 In addition to stress calculations, include in engineering calculations, design for deflection and rotational requirements, as applicable.

## **1.6 QUALITY ASSURANCE**

- 1.6.1 Manufacturers: Provide Products for Work of this Section by manufacturer with minimum 10 years' experience in the manufacture of such materials.
- 1.6.2 Installers: Provide work of this Section executed by competent installers with minimum 5 years' experience in manufacture, application of metal framing support system and assemblies specified and with approval and training of manufacturers. Demonstrate experience of Projects of similar scope and size, and evidence of a continuing quality assurance program for both materials and installation crews.
- 1.6.3 Single Source Responsibility: Ensure primary materials provided in this Section are obtained from 1 source by a single manufacturer and secondary materials are obtained from sources recommended by primary materials manufacturers.

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- 1.6.4 Licensed Professionals: Employ a full time professional structural engineer registered in the Province of Ontario, carrying minimum \$2,000,000.00 professional liability insurance to:
  - 1.6.4.1 design the components of the work of this Section requiring structural performance,
  - 1.6.4.2 be responsible for full assemblies and connections
  - 1.6.4.3 be responsible for determining sizes, yield strengths, gauge thicknesses and joint spacing to allow thermal movement and loading of components in accordance with applicable codes and regulations,
  - 1.6.4.4 be responsible for production and review of Shop Drawings,
  - 1.6.4.5 inspect the work of this Section during fabrication and erection,
  - 1.6.4.6 stamp and sign each shop drawing,
  - 1.6.4.7 Provide site administration and inspection of this part of the Work.
- 1.6.5 Welding:
  - 1.6.5.1 Provide welding in accordance with CSA W59-M performed by a fabricator and mechanics fully approved by Canadian Welding Bureau as specified herein.
  - 1.6.5.2 Certificates: Ensure inspection and testing company is certified by Canadian Welding Bureau, in Category 1, Buildings, under CSA W178.1.
  - 1.6.5.3 Ensure welding inspectors and supervisors are certified by Canadian Welding Bureau to CSA W178.2, to minimum level 2 certification.
- 1.6.6 Payment for specified works performed by inspection and testing company will be made from cash allowance specified in Division 1. Provide access for inspection to all places where work is manufactured, stockpiled or installed.
- 1.6.7 Preconstruction Testing: Allow appointed inspection and testing company to carry out shop inspection to verify:
  - 1.6.7.1 Structural materials and paints conform to Specifications.
  - 1.6.7.2 Fabrication erection and welding conforms to Specifications and dimensioned Shop Drawings.

## **1.7 DELIVERY, STORAGE AND HANDLING**

- 1.7.1 Delivery and Acceptance Requirements:
  - 1.7.1.1 Comply with material manufacturer's ordering instructions and lead time requirements to avoid delays.
  - 1.7.1.2 Provide materials stamped and identifiable by manufacturer and part number (where appropriate). Do not use or accept materials that appear damaged, distressed, unidentifiable or rusted.
- 1.7.2 Storage and Handling Requirements:
  - 1.7.2.1 Handle and store medical support system framing to ensure no damage or corrosion is caused to stored or erected works, or to adjacent construction.

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- 1.7.2.2 Protect architecturally exposed framing during fabrication, handling, storage and erection to prevent marring of surfaces exposed to view, by marking, bending, denting, or coarse grinding.
- 1.7.2.3 Protect materials from corrosion with factory applied finish.
- 1.7.2.4 Provide paintable PVC closure strips at rails exposed in finished construction.

## **1.8 WARRANTY**

- 1.8.1 Warrant work of this Section for period of 2 years against defects and deficiencies in accordance with General Conditions of the Contract. Promptly correct defects or deficiencies which become apparent within warranty period, to satisfaction of Consultant and at no expense to Owner. Defects include but are not limited to: failure of support system under normal loading conditions, premature failing of factory applied finish.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURERS**

- 2.1.1 Products of following manufacturers may be acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:
  - 2.1.1.1 Hilti; [www.hilti.com](http://www.hilti.com)
  - 2.1.1.2 Unistrut Canada; [www.unistrut.com](http://www.unistrut.com).
- 2.1.2 Substitution Limitations: This Specification is based on Products from companies listed herein.
- 2.1.3 Comparable Products from manufacturers listed herein will be considered provided they meet the requirements of this Specification, offering functionally, aesthetically equivalent products in Consultant's opinion and subject to Consultant's review.

### **2.2 DESCRIPTION**

- 2.2.1 Design and Performance Requirements:
  - 2.2.1.1 Provide factory-formed, field-assembled, modular equipment support system designed for attachment to either steel or concrete building structure, to serve as support for a variety of building components.
  - 2.2.1.2 Architectural Drawings and details are diagrammatic and are only intended to show design concept, aesthetics, interfacing requirements, configuration, components and arrangements. They are not intended to identify or solve completely problems of thermal and structural movements, assembly framing, engineering design, fixings and anchorages
  - 2.2.1.3 Ceiling Channel Grids: universal grid or manufacturer's standard type consisting of 2.78 mm (12 ga. - 0.109") cold-formed channel rails flush with finished ceiling and extending wall to wall unless otherwise noted

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- on Drawings. Design rails to be perpendicular to the path of travel of the equipment.
- 2.2.1.4 Ceiling Direct Mounting Channel Systems: Single channels consisting of 12 Gage 1-5/8" cold-formed channel rails flush with finished ceiling and extending wall to wall unless otherwise noted on Drawings. Design rails to be parallel to the path of travel of the equipment.
  - 2.2.1.5 Provide white-finished Take-Up rails with trolleys for Ceiling Channel Grids and Ceiling Direct Mounting Channel Systems.
  - 2.2.1.6 Design all systems in accordance with CAN/CSA S16 and CAN/CSA S136.
  - 2.2.1.7 Design medical support system to support suspended equipment including but not limited to following:
    - .1 Surgical Light Supports.
    - .2 Procedure/Exam Light Supports.
    - .3 Other equipment as noted on Drawings.
  - 2.2.2 Design loadings and rotational requirements: In accordance with each equipment manufacturer's specification.
  - 2.2.3 Deflection of Framing Members: At maximum design loadings, ensure deflection in either plane does not exceed 1.5 mm (0.06") or L/720 of the span, whichever is less.
  - 2.2.4 Design work to withstand within acceptable deflection limitations, variations from plumb in vertical and horizontal lines, its own weight, forces applied by movements of building structure and attached adjacent components and maximum design loads. Coordinate loads with actual equipment selection prior to fabrication and construction.
  - 2.2.5 Design system with rails perpendicular to path of travel of equipment. Locate rail centers as required by equipment manufacturer and allow continuous attachment along any point on rail.
  - 2.2.6 Do not permit medical support system framing and connections to encroach on clearance lines required for installation of work of other Sections. Coordinate layout to accommodate mechanical and electrical services, framing members and suspended equipment locations.
  - 2.2.7 Design all systems with adequate bracing in all four directions for lateral loading.

## **2.3 MATERIALS**

- 2.3.1 Structural Shapes, Plates, Etc.: New material conforming to CSA G40.20 and CSA G40.21, Grade 300W.
- 2.3.2 Hollow Structural Sections: New material conforming to CSA G40.20 and CSA G40.21, Grade 350W, Class H.
- 2.3.3 Steel Pipe: ASTM A53/A53M, Grade B, Standard weight, Schedule 40, galvanized finish.
- 2.3.4 Steel Tubing: ASTM A501/A501.

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2.3.5 Welding Materials: Conforming to CSA W48.1-M and CSA W59-M.

## **2.4 COMPONENTS**

2.4.1 Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.

2.4.1.1 Width of Channels: Minimum 41 mm (1 5/8").

2.4.1.2 Depth of Channels: As required to meet load capacities for supported equipment.

2.4.1.3 Continuous slot width: 22 mm (7/8").

2.4.1.4 Material: Galvanized steel, ASTM A653/A653M, structural steel, Grade 33 (Grade 230), with G90 (Z275) coating; minimum 2.78 mm (12 ga. - 0.109") nominal thickness.

2.4.1.5 Finish: Hot-dip galvanized.

2.4.2 Fittings: manufactured from steel meeting requirements of ASTM A575, ASTM A576, ASTM A36/A36M or ASTM A635/A635 as applicable to meet design requirements. Ensure all fittings are galvanized in accordance with ASTM A123/A123M. Minimum fitting thickness: 6 mm (1/4").

2.4.3 Channel Nuts: fabricated from steel conforming to ASTM A1011/A1011, SS, Grade 33.

2.4.4 Bolts and Fasteners: minimum SAE Grade 5, electro-galvanized finish. Threaded Rod Grade B7.

## **2.5 FABRICATION**

2.5.1 Fabricate work of this Section with members square, straight, plumb and true; joints accurately and tightly fitted; intersecting members in true, flush planes; fasteners concealed.

2.5.2 Fabricate, fit and assemble work in shop in greatest extent possible. Where shop fabrication is not possible, make trial assembly in shop.

2.5.3 Provide hangers, rods, bars, bolts, anchors, brackets, rivets, bearing plates and bracing, fitting, drilling, stopping, soldering, as required for a complete assembly.

2.5.4 Insulate dissimilar metals to prevent galvanic corrosion.

2.5.5 Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

2.5.6 Support Structure: Locate support members at ceiling as indicated on Contract Documents. Ceiling rails to consist of adequate structural members mounted back-to-back on continuous-slotted channel. Ensure spacing allows installation of standard modular ceiling fixtures and equipment. Design support structure to ensure medical equipment can be attached at any point of support system.

2.5.7 Ceiling Anchorage: Whenever possible, Provide attachment to structure above by means of indirect attachment to building's structural framing with any necessary additional support required.

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- 2.5.8 Vertical Supports: Rails and ceiling anchorage to be connected by a series of vertical channel drops; sized to suit loading conditions. Vertical supports to Provide for both basic and micro vertical adjustment.
- 2.5.9 Fabrication Tolerances: Fabricate medical support system within a tolerance of +/- 1.0mm, and with abutting ends of members at same level.

## **2.6 FINISHES**

- 2.6.1 Finish cold-formed channel and/or fitting members in accordance with one of the following standards:
- 2.6.2 Electro-Galvanized: Electrolytically zinc coated conforming to ASTM B633 Type III SC 1.
- 2.6.3 Hot-dip galvanized: Zinc coated by hot-dipped process prior to roll forming. Minimum G90 coating conforming to ASTM A653/A653.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- 3.1.1 Verification of Conditions:
  - 3.1.1.1 Verify actual site dimensions and location of adjacent materials prior to commencing work.
  - 3.1.1.2 Notify Consultant in writing of any conditions which would be detrimental to the installation.
  - 3.1.1.3 Commencement of work implies acceptance of previously completed work.

### **3.2 PREPARATION**

- 3.2.1 As far as practical, Install all supports to work around structural framing, mechanical ductwork, electrical lighting fixtures, and plumbing or other obstructions. Ensure requirements are fully coordinated prior to installation.

### **3.3 INSTALLATION**

- 3.3.1 Install system in accordance with manufacturer's instructions, MFMA-103 and in accordance with equipment manufacturer's recommendations to allow continuous attachment along any point on the rail.
- 3.3.2 Erect work of this Section plumb, square, true and level. Securely anchor work of this Section and rivet, weld or bolt to structural framing of building. Where secured to concrete, Provide bolts for setting in concrete. Provide expansion bolt supports to masonry.
- 3.3.3 Install wall moulding on Ceiling Channel Grids and Ceiling Direct Mounting Channel Systems in rooms to receive lay-in ceiling tile where applicable.
- 3.3.4 Shear off tek screws on the inside of the ceiling channel for equipment mounting block installation.

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- 3.3.5 Provide paintable snap-in closure strips into exposed rails in finished construction after the equipment has been installed unless otherwise indicated.
- 3.3.6 Provide necessary fitting, setting and cutting required in connection with the fitting of work of this Section to other parts of The Work.
- 3.3.7 Field Painting: Paint bolt heads, washers, nuts, field welds and previously unpainted items. Touch up shop primer damaged during transit and installation with matching paint.

### **3.4 CLEANING**

- 3.4.1 Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit or provide new units.
- 3.4.2 Protect finishes of from damage during construction period. Remove temporary protective coverings at time of Substantial Performance of the Work.

END OF SECTION



## **PART 1      GENERAL**

### **1.1      GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.
- 1.1.2 Contractor is solely responsible for dividing the Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of the Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2      SUMMARY**

- 1.2.1 Provide labour, materials, Products, equipment and services to complete the metal fabrications work specified herein. This includes, but is not necessarily limited, to:
  - 1.2.1.1 Steel framing and supports for countertops, benches, vanity units and miscellaneous architectural woodwork elements.
  - 1.2.1.2 Steel tube reinforcement for low partitions.
  - 1.2.1.3 Steel framing and supports for mechanical and electrical equipment.
  - 1.2.1.4 Steel framing and supports for applications where framing and supports are not specified in other Sections.
  - 1.2.1.5 Metal floor plate and supports.
  - 1.2.1.6 Miscellaneous steel trim including steel angle corner guards where shown on Drawings.
  - 1.2.1.7 Loose bearing and leveling plates for applications where they are not specified in other Sections.
  - 1.2.1.8 Steel framing and supports for washroom and shower accessories supporting downward loads, including shower seats, grab bars and change tables.
  - 1.2.1.9 Steel framing and supports for fire valve cabinets.
  - 1.2.1.10 Miscellaneous sections and framing as required to complete the Work and as indicated in the Canadian Institute for Steel Construction (CISC) - Handbook of Steel Construction "Appendix F" for applications where framing and supports are not explicitly specified in this section.
  - 1.2.1.11 Auxiliary materials required for a complete installation.
- 1.2.2 Related Requirements: Specifications throughout all Divisions of the Project shall be read as a whole, and may be directly applicable to this Section.

### **1.3      REFERENCES**

- 1.3.1 Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply. Refer to 01 42 19 - Reference Standards.

**1.4 DEFINITIONS**

1.4.1 Workmanship (as defined by AMP 555 – Draft Edition) for this Section must be in accordance with one of the following classes:

1.4.1.1 Class 1:

- .1 Exposed surfaces are finished smooth with pits, mill marks, nicks and scratches filled or ground off. Defects are not apparent when painted or polished.
- .2 Welds are concealed where possible. Exposed welds are ground to small radius with uniform sized coves unless indicated otherwise.
- .3 Distortions are not visible to the naked eyes.
- .4 Exposed joints are fitted to a hairline finish.

1.4.1.2 Class 2:

- .1 Exposed surfaces retain mill marks and moderate irregularities, but are generally not visible to the naked eye when viewed at 10 m (30 ft)
- .2 Exposed welds are ground to a uniform sized cove.
- .3 Exposed joints are fitted to a maximum gap of 1.6 mm (1/16 inch)

1.4.1.3 Class 3:

- .1 Exposed surfaces have no improvement from mill finish except preparation necessary for galvanizing, or priming.
- .2 Exposed welds are not ground.
- .3 Bolt, when used, may be exposed.

**1.5 COORDINATION**

1.5.1 Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written instructions to ensure that shop primers and topcoats are compatible with one another.

1.5.2 Coordinate installation of metal fabrications that are anchored to or that receive other work. Supply setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

**1.6 PREINSTALLATION MEETINGS**

1.6.1 Project Meetings, generally: in accordance with Section 01 31 19, Project Meetings.

1.6.2 Pre-installation Meetings: Schedule and hold a pre-installation meeting at the Project site at least one week before beginning work on this Section to coordinate activities with related Subcontractors.

1.6.2.1 Required Attendance: Subcontractor performing work of this Section, representatives from manufacturers and fabricators involved in or affected by installation.

- 1.6.2.2 Notification: Notify Consultant and Owner of scheduled meeting dates in advance; minimum 72 hour notice required.
- 1.6.2.3 Agenda:
  - .1 Review progress of related construction activities and preparations for particular activity under consideration.
  - .2 Make note of required sequencing and coordination with materials and activities that have preceded or will follow.
- 1.6.2.4 Reporting: Record significant discussions, agreements, and disagreements, including required corrective measures and actions.
- 1.6.2.5 Distribution: Distribute minutes of the meeting to each party present and to other parties requiring information not more than 72 hours after meeting.

## **1.7 SUBMITTALS**

- 1.7.1 Submittals, generally: in accordance with Section 01 33 00, Submittal Procedures.
- 1.7.2 Product Data: Submit manufacturer's product characteristics, catalogue cuts, installation instructions and other relevant information for each material and product used for metal fabrications work specified in this Section.
- 1.7.3 Shop Drawings: Submit Shop Drawings indicating material layouts, details of construction, connections, and relationship with adjacent construction. As a minimum indicate following:
  - 1.7.3.1 Include plans, elevations, sections and details as applicable.
  - 1.7.3.2 Indicate field-measured dimensions on Shop Drawings.
  - 1.7.3.3 Member sizes, locations, thickness (exclusive of coatings), metallic coatings and mechanical properties,
  - 1.7.3.4 Connection details for attaching framing to itself and to the structure,
  - 1.7.3.5 Dimensions, requirements of related work, and critical installation procedures,
  - 1.7.3.6 Temporary bracing required for erection purposes,
  - 1.7.3.7 Design loads,
  - 1.7.3.8 Welds indicated by welding symbols as defined in CSA-W59.
- 1.7.4 Delegated Design Submittals:
  - 1.7.4.1 Engineering design completion of metal fabrications work is delegated to Contractor based on structural design criteria indicated in Contract Documents.
  - 1.7.4.2 Submit Shop Drawings for work of this Section that bear the stamp of a Professional Engineer registered in Province of ON.
  - 1.7.4.3 Submit copy of structural calculations upon request by Consultant.
- 1.7.5 Embodied Carbon / Environmental Product Declarations (EPDs): When available, submit product-specific or industry-wide EPDs conforming to ISO 14025 or other recognized environmental Product declaration framework meeting following criteria:

- 1.7.5.1 EPD Scope: Must cover Cradle-to-Gate (A1 to A3) as a minimum.
- 1.7.5.2 EPD Impact Categories: Must report Global Warming Potential (GWP) in form of unit of kgCO<sub>2</sub>e/declared unit as a minimum.
- 1.7.5.3 Product Options: Give preference to Products with compliant documentation when choice is at Contractor's option.
- 1.7.6 Material Ingredient Disclosure: When available, submit documentation disclosing chemical inventory of materials to at least 0.1% (1000ppm) meeting following criteria:
  - 1.7.6.1 Standard: Health Product Declaration (HPD) Open Standard, Cradle to Cradle v2 (Basic level) or Cradle to Cradle v3 (Bronze level), International Living Future Institute (ILFI) Declare, or other approved material ingredient declaration framework.
  - 1.7.6.2 Product Options: Give preference to Products with compliant documentation when choice is at Contractor's option.
- 1.7.7 Low-Emitting Materials: For applicable Products specified or used for activities of this Section (i.e., site-applied coatings, adhesives, and sealants), submit certifications from third-party organizations indicating compliance with following:
  - 1.7.7.1 VOC Emissions: California Department of Public Health (CDPH) Standard Method v1.2–2017, using applicable exposure scenario.
  - 1.7.7.2 VOC Content: SCAQMD Rule 1113 (for paints and coatings) and SCAQMD Rule 1168 (for adhesives and sealants).
- 1.7.8 Welding Certificate: Submit certification for welding firms and welders to verify compliance with welding qualifications specified in this section.

## **1.8 CLOSEOUT SUBMITTALS**

- 1.8.1 Closeout Submittals, generally: in accordance with Section 01 78 00, Closeout Submittals.
- 1.8.2 Operating and Maintenance Data: Submit care and maintenance instructions for metal fabrications to be included in building operation and maintenance manual.
- 1.8.3 Warranty Documentation: Submit copy of extended warranties specified in this Section.

## **1.9 QUALITY ASSURANCE**

- 1.9.1 Manufacturer Qualifications: Provide Products for work of this Section by manufacturer with at least 5 years' experience manufacturing such materials.
- 1.9.2 Installer Qualifications: Engage an entity with at least five years' experience installing, erecting, or assembling work similar in material, design, and extent to that shown on Drawings and Schedules, and whose work has resulted in construction with a track record of successful in-service performance.
- 1.9.3 Welding Qualifications: Qualify procedures and personnel in accordance with the following:
  - 1.9.3.1 Steel: to CSA W47.1 and CSA W59
  - 1.9.3.2 Aluminum: to CSA W47.2 and CSA W59.2
  - 1.9.3.3 Stainless Steel: to CSA W47.1 (Annex K) and CSA W59.

- 1.9.4 Professional Engineer's Qualifications: Employ Professional Engineer licensed to practice in Province of ON who carries professional liability insurance and has at least five years' experience providing engineering services of similar kind, scope, and complexity.
  - 1.9.4.1 Professional Engineer's Responsibility:
    - .1 production and review of Shop Drawings,
    - .2 design and certification of metal fabrications, including attachments for building construction, in accordance with applicable codes and regulations,
    - .3 stamping and signing of each Shop Drawing and associated calculations
- 1.9.5 Single Source Responsibility: Obtain primary materials for this Section from a single source by a single manufacturer, and secondary materials from sources recommended by manufacturers of primary materials.
- 1.9.6 Mock-Ups / First Installation Review: Construct mock-ups to verify selections made under submittals, demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
  - 1.9.6.1 Location: In-situ (i.e. first installation), as directed on site by Consultant.
  - 1.9.6.2 Purpose: To set benchmarks for installation and to judge subsequent work. Maintain Mock-ups during construction in undisturbed condition.
  - 1.9.6.3 Reviewed mock-ups: May become part of the completed work if undisturbed at the time of Substantial Performance of The work, provided they are undisturbed, and comply with requirements outlined in Contract Documents.

## **1.10 DELIVERY, STORAGE AND HANDLING**

- 1.10.1 Product Requirements, generally: in accordance with Section 01 61 00, Common Product Requirements.
- 1.10.2 Deliver, store and handle metal fabrications materials in accordance with manufacturer's written instructions.
- 1.10.3 Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- 1.10.4 Store materials in off-ground, in clean, dry, well-ventilated area.
- 1.10.5 Replace defective or damaged materials with new.

## **1.11 FIELD CONDITIONS**

- 1.11.1 Environmental Restrictions: Do not deliver or install metal fabrications until building is enclosed, wet work is complete, and HVAC system is operational and will maintain temperature and relative humidity levels equal to occupancy levels for remainder of construction period.
- 1.11.2 Field Measurements: Verify actual dimensions of construction contiguous with metal fabrications by field measurements before fabrication.

**PART 2 PRODUCTS****2.1 PERFORMANCE / DESIGN CRITERIA**

2.1.1 Delegated Design: Employ a qualified professional engineer, as specified in this Section, to design elements of this section requiring structural performance and based on the following:

2.1.1.1 Steel Elements: to CSA S16, unless indicated otherwise.

2.1.1.2 Cold-Formed Steel: to CSA S136.

2.1.1.3 Aluminum: to CSA S157/S157.1

2.1.1.4 Where components specified in this Section will be subject to upward or downward pull by human interaction (e.g. supports for grab bars, shower seats, etc.) provide elements capable of withstanding the following loads under conditions indicated:

.1 Minimum load ratings: 1.3 kN (292 lb-f)

.2 Maximum Deflection between supports:  $L/144$  or 3 mm (1/8") whichever is less.

2.1.2 Metal Surfaces - Appearance:

2.1.2.1 Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

.1 Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

2.1.2.2 Provide metal fabrications complying with the following classes as defined in this Section:

.1 Class 1 Workmanship: Items that are exposed to view in finished spaces in completed Work.

.2 Class 2 Workmanship: Items that are exposed to view in utility areas of the completed Work.

.3 Class 3 Workmanship: Items that are concealed from view in the completed Work

2.1.3 Exterior Metal Fabrications: fabricate and install to prevent buckling, opening up of joints and overstressing of welds and fasteners under the following temperature conditions:

2.1.3.1 Temperature Change: ambient temperature cycling of - 30 deg C (-22 deg F) to 82 deg C (180 deg F) over a 12 hour period.

2.1.4 VOC Content and Emissions:

2.1.4.1 VOC Emissions: For applicable items in this Section, comply with CDPH Standard Method v1.2–2017 (CA Spec 01350) and ensure products are certified per UL 2818, SCS Global Gold, or equivalent.

2.1.4.2 VOC Content Requirements: Wet-applied materials used in scope of this Section must conform to the following:

- .1 Paints and Coatings: SCAQMD Rule 1113 or CARB SCM.
- .2 Adhesives and Sealants: SCAQMD Rule 1168.
- .3 Methylene chloride and perchloroethylene must not be intentionally added in paints, coatings, adhesives, or sealants.

## **2.2 FERROUS METALS**

- 2.2.1 Steel Plates, Shapes, and Bars: CSA G40.20/G40.21, Grade 350W or equivalent to ASTM A36/A36M
- 2.2.2 Rolled-Steel Floor Plate: ASTM A786/A786M, rolled from plate complying with ASTM A36/A36M or CSA G40.20/G40.21 or ASTM A283/A283M, Grade C or D.
- 2.2.3 Rolled-Stainless Steel Floor Plate: ASTM A793.
- 2.2.4 Steel Tubing: ASTM A500/A500M, cold-formed steel tubing.
- 2.2.5 Steel Pipe: ASTM A53/A53M, Standard Weight Schedule 40 unless otherwise indicated.
- 2.2.6 Slotted Channel Framing (Unistrut): Cold-formed metal box channels struts complying with MFMA-4.
  - 2.2.6.1 Size of Channels: As indicated on reviewed Shop Drawings.
  - 2.2.6.2 Material: Galvanized steel, ASTM A653/A653M, structural steel, Grade 230 (Grade 33), with Z275 (G90) coating; minimum 2-mm (0.079-in.) nominal thickness.

## **2.3 NON-FERROUS METALS**

- 2.3.1 Aluminum Plate and Sheet: ASTM B209M (ASTM B209), Alloy 6061-T6.
- 2.3.2 Aluminum Extrusions: ASTM B221M (ASTM B221), Alloy 6063-T6.
- 2.3.3 Aluminum-Alloy Rolled Tread Plate: ASTM B632/B632M, Alloy 6061-T6.
- 2.3.4 Aluminum Castings: ASTM B26/B26M, Alloy 443.0-F.
- 2.3.5 Stainless Steel Sheet, Strip, and Plate: ASTM A240/A240M or ASTM A666, Type 304 for interior and Type 316L for exterior.
- 2.3.6 Stainless Steel Bars and Shapes: ASTM A276/A276M, Type 304 for interior and Type 316L for exterior.

## **2.4 FASTENERS**

- 2.4.1 General Requirements: Unless otherwise indicated, provide stainless steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
- 2.4.2 Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM F568M, Property Class 4.6 (ASTM A307, Grade A); with hex nuts, ASTM A563M (ASTM A563); and, where indicated, flat washers.
- 2.4.3 Stainless Steel Bolts and Nuts: Regular hexagon-head annealed stainless steel bolts, ASTM F738M (ASTM F593); with hex nuts, ASTM F836M (ASTM F594); and, where indicated, flat washers; Alloy Group A1 (1) .

- 2.4.4 Anchor Bolts: ASTM F1554, Grade 36, of dimensions indicated; with nuts, ASTM A563M (ASTM A563); and, where indicated, flat washers.
  - 2.4.4.1 Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.
- 2.4.5 Anchors - General Requirements: Capable of sustaining, without failure, loads imposed with appropriate safety factors, as determined by testing in accordance with ASTM E488/E488M, conducted by a qualified independent testing agency.
- 2.4.6 Slotted-Channel Inserts: Cold-formed, hot-dip galvanized-steel box channels struts complying with MFMA-4, 41 by 22 mm (1-5/8 by 7/8 in.) by length indicated with anchor straps or studs minimum 75 mm (3 in.) long at maximum 200 mm (8 in.) o.c. Provide with temporary filler and tee-head bolts, complete with washers and nuts, all zinc-plated to comply with ASTM B633, Class Fe/Zn 5, as needed for fastening to inserts.

## **2.5 AUXILIARY INSTALLATION MATERIALS**

- 2.5.1 Welding materials: to CSA W59.
- 2.5.2 Welding electrodes: to CSA W48 Series.
- 2.5.3 Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with CISC/ CPMA Standards 1-73a and 2-75 and MPI#79 and compatible with topcoat.
  - 2.5.3.1 Use primer containing pigments that make it easily distinguishable from zinc-rich primer.
- 2.5.4 Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.
- 2.5.5 Galvanizing Repair Paint: High-zinc-dust-content paint (not less than 93 percent) complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- 2.5.6 Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.
- 2.5.7 Shrinkage-Resistant Grout: Factory-packaged, nonmetallic, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M with compressive strength of 15 MPa at 24 hours. Provide grout specifically recommended by manufacturer for interior and exterior applications.
  - 2.5.7.1 Acceptable Product: 'Sika Grout 212' by Sika Canada Inc., or approved equivalent.

## **2.6 FABRICATION - GENERAL REQUIREMENTS**

- 2.6.1 Fabricate work square, true, straight, and accurate to required size, with joints closely fitted and properly secured.
- 2.6.2 Weld connections unless indicated otherwise.
- 2.6.3 Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.



- 2.6.4 Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1 mm (1/32 in.) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- 2.6.5 Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- 2.6.6 Form exposed work with accurate angles and surfaces and straight edges.
- 2.6.7 Weld corners and seams continuously to comply with the following:
  - 2.6.7.1 Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2.6.7.2 Obtain fusion without undercut or overlap.
  - 2.6.7.3 Remove welding flux immediately.
  - 2.6.7.4 At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- 2.6.8 Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head countersunk fasteners unless otherwise indicated. Locate joints where least conspicuous.
- 2.6.9 Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- 2.6.10 Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- 2.6.11 Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
- 2.6.12 Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 3.2 by 38 mm (1/8 by 1-1/2 in.), with a minimum 150-mm (6-in.) embedment and 50-mm (2-in.) hook, minimum 200 mm (8 in.) from ends and corners of units and 600 mm (24 in.) o.c., unless otherwise indicated.
- 2.6.13 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.

## **2.7 GENERAL FINISH REQUIREMENTS**

- 2.7.1 Finish metal fabrications after assembly.
- 2.7.2 Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.
- 2.7.3 Galvanize miscellaneous framing and supports at exterior locations; prime paint miscellaneous framing and supports at interior locations.

## **2.8 STEEL AND IRON FINISHES**

- 2.8.1 Galvanizing: Hot-dip galvanize items to comply with ASTM A153/A153M for steel and iron hardware and with ASTM A 123/A 123M or equivalent to CAN/CSA-G164 for other steel and iron products.
  - 2.8.1.1 Do not quench or apply post-galvanizing treatments that might interfere with paint adhesion.
  - 2.8.1.2 Preparation for Shop Priming of Galvanized Items: After galvanizing, thoroughly clean galvanized surfaces of grease, dirt, oil, flux, and other foreign matter, and treat with metallic phosphate process.
- 2.8.2 Preparation for Shop Priming: Prepare surfaces to comply with requirements indicated below:
  - 2.8.2.1 Exterior Items: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
  - 2.8.2.2 Items Indicated to receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
  - 2.8.2.3 Other Steel Items: SSPC-SP 3, "Power Tool Cleaning."
  - 2.8.2.4 Galvanized-Steel Items: SSPC-SP 16, "Brush-off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals."
- 2.8.3 Shop Priming:
  - 2.8.3.1 Shop prime items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated. Shop prime with universal shop primer unless indicated otherwise.
  - 2.8.3.2 Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.
  - 2.8.3.3 Stripe paint corners, crevices, bolts, welds, and sharp edges.

## **2.9 ALUMINUM FINISHES**

- 2.9.1 As-Fabricated Finish: AA-M12.
- 2.9.2 Clear Anodic Finish: AAMA 611, Class I, AA-M12C22A41.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- 3.1.1 Verify actual site conditions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.

### **3.2 INSTALLATION**

- 3.2.1 Installation, generally: Install work of this Section in strict accordance with manufacturer's written installation instructions and reviewed Shop Drawings.

Supplement manufacturer's installation instructions with additional installation requirements specified in this Section to produce specified work results.

- 3.2.2 Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- 3.2.3 Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations.
- 3.2.4 Field Welding: Comply with CSA W59 and the following requirements:
  - 3.2.4.1 Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 3.2.4.2 Obtain fusion without undercut or overlap.
  - 3.2.4.3 Remove welding flux immediately.
  - 3.2.4.4 At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- 3.2.5 Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, and other connectors.
- 3.2.6 Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- 3.2.7 Corrosion Protection / Isolation Coating: Isolate aluminum from following components, by means of bituminous paint:
  - 3.2.7.1 Dissimilar metals except stainless steel, zinc, or white bronze of small area.
  - 3.2.7.2 Concrete, mortar and masonry.
  - 3.2.7.3 Wood.
- 3.2.8 Provide separator membrane/mastic between steel and substrates of concrete, masonry, or dissimilar metals.

### **3.3 INSTALLATION OF MISCELLANEOUS FRAMING AND SUPPORTS**

- 3.3.1 General Requirements: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.
- 3.3.2 Anchor supports securely to, and rigidly brace from, building structure.

### **3.4 REPAIRS**

- 3.4.1 Touchup Painting:
  - 3.4.1.1 Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

- .1 Apply by brush or spray to provide a minimum 0.05-mm (2.0-mil) dry film thickness.

- 3.4.2 Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780/A780M.

### **3.5 METAL FABRICATION SCHEDULE**

- 3.5.1 Provide steel framing and supports not specified in other Sections as needed to complete the Work.

- 3.5.2 Where items are required to be built into masonry, concrete or other work, supply such items to respective Sections with required anchors and accessories for building in.

- 3.5.3 Following Schedule is a list of principal items only and is not necessarily exhaustive. Review Drawings and other Specifications, including those pertaining to structural, mechanical, and electrical work, to determine full scope of metal fabrications required for this Project.

#### **3.5.4 MISCELLANEOUS STEEL TRIM**

- 3.5.4.1 Fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.

- 3.5.4.2 Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.

- 3.5.4.3 Provide with integrally welded steel strap anchors for embedding in concrete or masonry construction.

- 3.5.4.4 Galvanize exterior miscellaneous steel trim.

- 3.5.4.5 Prime paint interior miscellaneous steel trim.

- 3.5.4.6 Surface Applied Corner Guards (Back-of-House): Provide corner guards fabricated from angles of sizes shown, or if not shown, of minimum 114 mm x 114 mm x 6 mm (4-1/2 in x 4-1/2 in x 6 mm) thick equal leg angles. Drill and countersink legs of angles, for fastening to substrates indicated, with holes spaced maximum 600 mm (24 in) on center. Provide corner guard lengths minimum 1200 mm (48 in) above finished floor level, if not otherwise indicated.

- 3.5.4.7 Cast-In Pit Angles and Edge Angles: Provide edge angles, and pit angles, fabricated from angles of size as shown, or required, with welded-on stud anchors spaced 600 mm (24 in) on center. Provide pit and edge angles in as long lengths as possible. Miter and weld corners and provide splice plates for alignment between sections.

#### **3.5.5 STEEL WELD PLATES AND ANGLES**

- 3.5.5.1 Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

#### **3.5.6 MISCELLANEOUS FRAMING AND SUPPORTS**

3.5.6.1 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 Fabricate units from slotted channel framing where indicated.

.2 Supply inserts for units installed after concrete is placed.

**3.5.7 COUNTERTOPS, AND MISCELLANEOUS ARCHITECTURAL WOODWORK FRAMING**

3.5.7.1 Custom-fabricate countertop, vanity framing, using steel shapes and plates for support framing, to thicknesses, sizes and shapes required to produce work of adequate strength and durability, without objectionable deflections.

3.5.7.2 Use proven details of fabrication, as required, to achieve proper assembly and alignment of the various components of the work.

**END OF SECTION**

## **PART 1      GENERAL**

### **1.1      GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.
- 1.1.2 Contractor is solely responsible for dividing the Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of the Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2      SUMMARY**

- 1.2.1 Provide labour, materials, products, equipment and services to complete the rough carpentry work specified herein. This includes, but is not necessarily limited, to:
  - 1.2.1.1 Miscellaneous furring and blocking,
  - 1.2.1.2 Electrical and equipment mounting panels.
- 1.2.2 Related Requirements: Specifications throughout all Divisions of the Project shall be read as a whole, and may be directly applicable to this Section.

### **1.3      REFERENCES**

- 1.3.1 Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply. Refer to 01 42 00 - References.

### **1.4      PREINSTALLATION MEETINGS**

- 1.4.1 Project Meetings, generally: in accordance with Section 01 31 19, Project Meetings.
- 1.4.2 Pre-installation Meetings: Schedule and hold a pre-installation meeting at the Project site at least one week before beginning work on this Section to coordinate activities with related Subcontractors.
  - 1.4.2.1 Required Attendance: Subcontractor performing work of this Section, representatives from manufacturers and fabricators involved in or affected by installation.
  - 1.4.2.2 Notification: Notify Consultant and Owner of scheduled meeting dates in advance; minimum 72 hour notice required.
  - 1.4.2.3 Agenda:
    - .1 Review progress of related construction activities and preparations for particular activity under consideration.
    - .2 Make note of required sequencing and coordination with materials and activities that have preceded or will follow.

- 1.4.2.4 Reporting: Record significant discussions, agreements, and disagreements, including required corrective measures and actions.
- 1.4.2.5 Distribution: Distribute minutes of the meeting to each party present and to other parties requiring information not more than 72 hours after meeting.

## **1.5 SUBMITTALS**

- 1.5.1 Submittals, generally: in accordance with Section 01 33 00, Submittal Procedures.
- 1.5.2 Product Data:
  - 1.5.2.1 Where fire-retardant-treated carpentry is used, submit data for fire-retardant treatment from chemical treatment manufacturer, as well as certification from treating plant, that the treated materials meet requirements specified in this Section.
  - 1.5.2.2 Include data on physical properties of treated materials based on independent testing by a qualified testing agency.
- 1.5.3 Embodied Carbon / Environmental Product Declarations (EPDs): When available, submit product-specific or industry-wide EPDs conforming to ISO 14025 or other recognized environmental Product declaration framework meeting following criteria:
  - 1.5.3.1 EPD Scope: Must cover Cradle-to-Gate (A1 to A3) as a minimum.
  - 1.5.3.2 EPD Impact Categories: Must report Global Warming Potential (GWP) in form of unit of kgCO<sub>2</sub>e/declared unit as a minimum.
  - 1.5.3.3 Product Options: Give preference to Products with compliant documentation when choice is at Contractor's option.
- 1.5.4 Material Ingredient Disclosure: When available, submit documentation disclosing chemical inventory of materials to at least 0.1% (1000ppm) meeting following criteria:
  - 1.5.4.1 Standard: Health Product Declaration (HPD) Open Standard, Cradle to Cradle v2 (Basic level) or Cradle to Cradle v3 (Bronze level), International Living Future Institute (ILFI) Declare, or other approved material ingredient declaration framework.
  - 1.5.4.2 Product Options: Give preference to Products with compliant documentation when choice is at Contractor's option.
- 1.5.5 Low-Emitting Materials: For applicable Products specified or used for activities of this Section (i.e., site-applied coatings, adhesives, and sealants), submit certifications from third-party organizations indicating compliance with following:
  - 1.5.5.1 VOC Emissions: California Department of Public Health (CDPH) Standard Method v1.2–2017, using applicable exposure scenario.
  - 1.5.5.2 VOC Content: SCAQMD Rule 1113 (for paints and coatings) and SCAQMD Rule 1168 (for adhesives and sealants).

**1.6 DELIVERY, STORAGE AND HANDLING**

- 1.6.1 Product Requirements, generally: in accordance with Section 01 61 00, Common Product Requirements.
- 1.6.2 Stack lumber flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.
- 1.6.3 Deliver interior wood materials that are to be exposed to view only after building is enclosed and weatherproof, wet work other than painting is dry, and HVAC system is operating and maintaining temperature and humidity at occupancy levels.

**PART 2 PRODUCTS****2.1 REGULATORY REQUIREMENTS**

- 2.1.1 Lumber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board conforming to the Standard Grading Rules for Canadian Lumber published by the National Lumber Grades Authority.
- 2.1.2 Plywood and wood-based composite panel construction identification: by grade mark in accordance with applicable CSA standards. Ensure plywood grading agency is certified by APA The Engineered Wood Association;  
<http://www.apawood.org>
- 2.1.3 Preservative Pressure-Treated and Fire-Retardant-Treated Wood and Plywood identification: by grade mark in accordance with the Canadian Wood Preservers Bureau and applicable ULC standards acceptable to authorities having jurisdiction.
- 2.1.4 Identify lumber by grade stamp of an agency certified by Canadian Lumber Standards Administration Board

**2.2 PERFORMANCE / DESIGN CRITERIA**

- 2.2.1 Visual Characteristics: Measure knots, checks, shakes and slope of grain in visually graded lumber in accordance with ASTM D245 with exceptions as noted under NLGA 120d.
- 2.2.2 Use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes when preservative or fire-retardant treatment is required for exposed items designated to receive a stained or natural finish.
- 2.2.3 Maximum moisture content for materials specified in this Section: 19%.
- 2.2.4 Do not use materials that are warped or do not comply with requirements specified herein.
- 2.2.5 VOC Content and Emissions:
  - 2.2.5.1 VOC Emissions: For applicable items in this Section, comply with CDPH Standard Method v1.2–2017 (CA Spec 01350) and ensure products are certified per UL 2818, SCS Global Gold, or equivalent.



- 2.2.5.2 VOC Content Requirements: Wet-applied materials used in scope of this Section must conform to the following:
  - .1 Paints and Coatings: SCAQMD Rule 1113 or CARB SCM.
  - .2 Adhesives and Sealants: SCAQMD Rule 1168.
  - .3 Methylene chloride and perchloroethylene must not be intentionally added in paints, coatings, adhesives, or sealants.
- 2.2.5.3 Composite Wood (if applicable): must be ULEF or NAF type per CARB ATCM. Do not adhesives that contain urea-formaldehyde.

## **2.3 LUMBER MATERIALS**

- 2.3.1 Standard Lumber: to CSA O141, No. 2 White Pine, No. 2 Red Pine, or No. 1 Construction S-P-F, lumber with moisture content of 19% or less, kiln-dried, free from sap, shakes, splits, knots and other defects for furring, blocking, nailing strips, grounds, rough bucks, cants, backing and sleepers as applicable.
- 2.3.2 Surfacing: minimum S2S (surfaced 2 sides) in concealed locations; minimum S4S (surfaced 4 sides) in exposed locations.
- 2.3.3 Board sizes: "Standard" or better grade.
- 2.3.4 Dimension sizes: "Standard" light framing or better grade.
- 2.3.5 Consultant reserves the right to select species and appearance grades to suit design requirements.

## **2.4 PANEL MATERIALS**

- 2.4.1 Plywood: Following types are acceptable unless indicated otherwise:
  - 2.4.1.1 Douglas Fir Plywood (DFP): to CSA-O121, G2S, standard construction, minimum 19 mm (3/4 inch) thickness unless indicated otherwise on Drawings.
  - 2.4.1.2 Canadian Softwood Plywood (CSP): to CSA-O151 G2S, standard construction, minimum 19 mm (3/4 inch) thickness unless indicated otherwise on Drawings.
- 2.4.2 Exterior Locations: DFP or CSP as specified herein, exterior-grade construction, kiln-dried to a moisture content of 15% or less, minimum 19 mm (3/4 inch) thickness unless indicated otherwise on Drawings.

## **2.5 FIRE-RETARDANT-TREATED WOOD AND PLYWOOD**

- 2.5.1 Treatment: Provide chemical treatment acceptable to authorities having jurisdiction and containing no arsenic or chromium from one of the following manufacturers:
  - 2.5.1.1 Dircon
  - 2.5.1.2 FireFree
  - 2.5.1.3 Approved equivalent.
- 2.5.2 Surface Burning Characteristics: flame spread rating of 25 or less in accordance with CAN/ULC-S102.
  - 2.5.2.1 Do not damage or otherwise affect ULC Label.

- 2.5.3 Application: Provide fire-retardant-treatment for following wood elements and other items indicated on Drawings to receive treatment:

2.5.3.1 Plywood backing panels.

## **2.6 ACCESSORIES**

- 2.6.1 Supply rough hardware to frame and fix rough carpentry including but not limited to bolts, anchors, nails, expansion shields and other fastenings required.
- 2.6.2 Wire Nails, Spikes and Staples: Conforming to CSA B111.
- 2.6.3 Exterior locations and treated lumber: Stainless steel nails, type 316. Nails that are plain-galvanized, electroplated, or made of aluminum are unacceptable.
- 2.6.4 Provide spiral thread nails except as indicated otherwise.
- 2.6.5 Bolts: ASTM A307, minimum 12 mm (½") complete with nuts and washers.
- 2.6.6 Proprietary fasteners (toggle bolts, expansion shields, screws, organic fibre plugs etc.): recommended for purpose by manufacturers.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- 3.1.1 Verify actual site conditions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.

### **3.2 PREPARATION**

- 3.2.1 Treat surfaces with wood preservative or fire retardant treatments before installation.
- 3.2.2 Use dust collectors and high quality respirator masks when cutting or sanding wood panels.
- 3.2.3 Apply preservative by dipping or by brush to completely saturate and maintain wet film on surface for minimum 3-minute soak on lumber and 1-minute soak for plywood.

### **3.3 INSTALLATION**

- 3.3.1 Comply with requirements indicated in OBC, Section 9.23 as supplemented by requirements specified in this Section.
- 3.3.2 Properly frame together parts of the work with members accurately cut to size, closely fitted, well spiked, and erected in a substantial manner, plumb, level, square and true to dimension.
- 3.3.3 Locate joints over bearing or supporting surfaces.
- 3.3.4 Provide running members full length wherever possible.
- 3.3.5 Design for expansion and contraction of the materials.

- 3.3.6 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- 3.3.7 Provide fasteners and rough hardware for a rigid and secure installation. In addition to mechanical fasteners, place continuous adhesive bead where appropriate in accordance with manufacturer's instructions.
- 3.3.8 Countersink bolts where necessary to provide clearance for other work.
- 3.3.9 Select exposed framing for appearance. Install lumber and panel materials so that grade-marks and other defacing marks are concealed or are removed by sanding where materials are left exposed.
- 3.3.10 Provide plywood, blocking, furring, nailers, rough carpentry, grounds and nailing strips, as required for proper installation and to support miscellaneous work indicated on Drawings to meet design requirements.

### **3.4 PLYWOOD BACKING PANELS**

- 3.4.1 Install wood panels required for mechanical, electrical and communication trades for mounting of items including but not limited to control boards, panel boards, pull boxes, splitters, switches, wall-mounted switch gear, junction boxes, electrical cabinets, data control equipment, disconnect switches, fire alarm control equipment, lighting control equipment, sound/communication equipment and other similar devices.
- 3.4.2 Provide plywood backboard panels in one piece screw-fastened and securely mounted to wall surfaces by use of fire-retardant-treated wood strapping.
- 3.4.3 Ensure panel size and mounting height suit mechanical and electrical requirements and are acceptable to respective Consultants. Apply to all surfaces and edges of plywood panels 1 coat of fire-retardant wood preservative to surfaces and edges of plywood panels.

### **3.5 PROTECTION**

- 3.5.1 Protect installed products and components from damage during construction.
- 3.5.2 Repair damage to adjacent materials caused by rough carpentry installation.

### **3.6 PROTECTION**

- 3.6.1 Protect rough carpentry from weather. If, despite protection, rough carpentry becomes sufficiently wet that moisture content exceeds that specified, apply borate treatment complying with requirements of authorities having jurisdiction in regards to toxicity.

### **3.7 CLEANING AND WASTE MANAGEMENT**

- 3.7.1 Cleaning and Waste Management, generally: in accordance with Section 01 74 00, Cleaning and Waste Management.
- 3.7.2 Cleaning: Maintain clean construction area at the end of each day. When activities of this Section are complete, remove materials, tools, equipment and rubbish.

- 3.7.3 Waste Management and Disposal: sort waste for reuse, recycling, or disposal, as specified. Remove recycling bins and containers from site and dispose of contents at the appropriate waste disposal facilities.

**END OF SECTION**

**ISSUED DATE:** 2025-11-20  
**ISSUED FOR:** TENDER

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## **PART 1      GENERAL**

### **1.1      GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.
- 1.1.2 Contractor is solely responsible for dividing the Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of the Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2      SUMMARY**

- 1.2.1 Provide labour, materials, Products, equipment and services to complete the architectural wood casework work specified herein. This includes, but is not necessarily limited, to:
  - 1.2.1.1 Casework and associated hardware.
  - 1.2.1.2 Closet and utility shelving.
  - 1.2.1.3 Auxiliary materials required for a complete installation.
- 1.2.2 Related Requirements: Specifications throughout all Divisions of the Project shall be read as a whole, and may be directly applicable to this Section.

### **1.3      REFERENCES**

- 1.3.1 Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply. Refer to Section 01 42 00, References.

### **1.4      PREINSTALLATION MEETINGS**

- 1.4.1 Project Meetings, generally: in accordance with Section 01 31 19, Project Meetings.
- 1.4.2 Pre-installation Meetings: Schedule and hold a pre-installation meeting at the Project site at least one week before beginning work on this Section to coordinate activities with related Subcontractors.
  - 1.4.2.1 Required Attendance: Subcontractor performing work of this Section, representatives from manufacturers and fabricators involved in or affected by installation.
  - 1.4.2.2 Notification: Notify Consultant and Owner of scheduled meeting dates in advance; minimum 72 hour notice required.
  - 1.4.2.3 Agenda:
    - .1 Review progress of related construction activities and preparations for particular activity under consideration.

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- .2 Make note of required sequencing and coordination with materials and activities that have preceded or will follow.
- 1.4.2.4 Reporting: Record significant discussions, agreements, and disagreements, including required corrective measures and actions.
- 1.4.2.5 Distribution: Distribute minutes of the meeting to each party present and to other parties requiring information not more than 72 hours after meeting.

## **1.5 ADMINISTRATIVE REQUIREMENTS**

- 1.5.1 Coordination:
  - 1.5.1.1 Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that architectural wood casework and related items can be supported and installed as indicated.
  - 1.5.1.2 Perform pre-wiring and partial mounting of electrical and audio/visual equipment and concealed wiring required. Finalize location of outlets and similar items with Consultant prior to installation.
  - 1.5.1.3 Where wood casework is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings.
  - 1.5.1.4 Coordinate fabrication schedule with construction progress to avoid delaying the Work.
  - 1.5.1.5 Locate concealed framing, blocking, and reinforcements that support wood casework by field measurements before being enclosed, and indicate measurements on Shop Drawings.

## **1.6 SUBMITTALS**

- 1.6.1 Submittals, generally: in accordance with Section 01 33 00, Submittal Procedures.
- 1.6.2 Product Data: Submit manufacturer's product characteristics, catalogue cuts, installation instructions and other relevant information for each material and product used for architectural wood casework work specified in this Section.
- 1.6.3 Safety Data Sheets (SDS): Submit SDS for inclusion in Operation and Maintenance Manual specified in Section 01 78 00, for adhesives, sealants and any other material designated by Consultant.
- 1.6.4 Shop Drawings: Submit Shop Drawings indicating material layouts, details of construction, connections, and relationship with adjacent construction. As a minimum indicate following:
  - 1.6.4.1 Include plans, elevations, sections and details as applicable.
  - 1.6.4.2 Indicate field-measured dimensions on Shop Drawings.
  - 1.6.4.3 material characteristics, details of construction, connections and relationship with adjacent construction.

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- 1.6.4.4 locations and sizes of cutouts and holes for plumbing and electrical fixtures, lavatories and similar items required in architectural wood casework; coordinate with appropriate trades.
- 1.6.4.5 show connections, attachments, reinforcing, anchorage and location of exposed fastenings in accordance with NAAWS Section 1.
- 1.6.5 Embodied Carbon / Environmental Product Declarations (EPDs): When available, submit product-specific or industry-wide EPDs conforming to ISO 14025 or other recognized environmental Product declaration framework meeting following criteria:
  - 1.6.5.1 EPD Scope: Must cover Cradle-to-Gate (A1 to A3) as a minimum.
  - 1.6.5.2 EPD Impact Categories: Must report Global Warming Potential (GWP) in form of unit of kgCO<sub>2</sub>e/declared unit as a minimum.
  - 1.6.5.3 Product Options: Give preference to Products with compliant documentation when choice is at Contractor's option.
- 1.6.6 Material Ingredient Disclosure: When available, submit documentation disclosing chemical inventory of materials to at least 0.1% (1000ppm) meeting following criteria:
  - 1.6.6.1 Standard: Health Product Declaration (HPD) Open Standard, Cradle to Cradle v2 (Basic level) or Cradle to Cradle v3 (Bronze level), International Living Future Institute (ILFI) Declare, or other approved material ingredient declaration framework.
  - 1.6.6.2 Product Options: Give preference to Products with compliant documentation when choice is at Contractor's option.
- 1.6.7 Low-Emitting Materials: For applicable Products specified or used for activities of this Section (i.e., site-applied coatings, adhesives, and sealants), submit certifications from third-party organizations indicating compliance with following:
  - 1.6.7.1 VOC Emissions: California Department of Public Health (CDPH) Standard Method v1.2–2017, using applicable exposure scenario.
  - 1.6.7.2 VOC Content: SCAQMD Rule 1113 (for paints and coatings) and SCAQMD Rule 1168 (for adhesives and sealants).
- 1.6.8 Samples: Submit selection and verification samples for Products requiring colour, texture, or design selection. Submit manufacturer's list of finishes or colour swatches for Consultant's selection.
  - 1.6.8.1 As a minimum submit samples of the following:
    - .1 For each colour of plastic laminate or wood veneer species selected (as applicable), submit manufacturer's standard 300 mm x 460 mm (12" x 18") chips.
    - .2 For each type of hardware.

## **1.7 CLOSEOUT SUBMITTALS**

- 1.7.1 Closeout Submittals, generally: in accordance with Section 01 78 00, Closeout Submittals.

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- 1.7.2 Operating and Maintenance Data: Submit care and maintenance instructions for architectural wood casework to be included in building operation and maintenance manual.
- 1.7.3 Warranty Documentation: Submit copy of extended warranties specified in this Section.

## **1.8 QUALITY ASSURANCE**

- 1.8.1 Fabricator Qualifications: Provide Products for Work of this Section by casework fabricator with minimum 10 years' experience in the manufacture of such materials, and who has been a member of AWMAC in good standing for the previous 2 years.
- 1.8.2 Installer Qualifications: Engage an entity with at least five years' experience installing, erecting, or assembling work similar in material, design, and extent to that shown on Drawings and Schedules, and whose work has resulted in construction with a track record of successful in-service performance, and who have been members of AWMAC in good standing for the previous 2 years.
- 1.8.3 Single Source Responsibility: Obtain primary materials for this Section from a single source by a single manufacturer, and secondary materials from sources recommended by manufacturers of primary materials.
- 1.8.4 Mock-Ups / First Installation Review: Construct mock-ups to verify selections made under submittals, demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
  - 1.8.4.1 Location: In-situ (i.e. first installation), as directed on site by Consultant.
  - 1.8.4.2 Purpose: To set benchmarks for installation and to judge subsequent work. Maintain Mock-ups during construction in undisturbed condition.
  - 1.8.4.3 Reviewed mock-ups: May become part of the completed work if undisturbed at the time of Substantial Performance of The work, provided they are undisturbed, and comply with requirements outlined in Contract Documents.

## **1.9 DELIVERY, STORAGE AND HANDLING**

- 1.9.1 Product Requirements, generally: in accordance with Section 01 61 00, Common Product Requirements.
- 1.9.2 Deliver, store and handle architectural wood casework materials in accordance with manufacturer's written instructions.
  - 1.9.2.1 Cover and protect finished surfaces with heavy kraft paper and method acceptable to Consultant. Do not remove protective covers until immediately prior to final cleaning.
  - 1.9.2.2 Where applicable, handle, store, and install fire-retardant-treated wood to comply with manufacturer's written instructions, including requirements for adhesives used to install wood casework.
- 1.9.3 Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.



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- 1.9.4 Store materials in off-ground, in clean, dry, well-ventilated area.
- 1.9.5 Replace defective or damaged materials with new.

## **1.10 FIELD CONDITIONS**

- 1.10.1 Environmental Restrictions: Do not deliver or install architectural wood casework until building is enclosed, wet work is complete, and HVAC system is operational and will maintain temperature and relative humidity levels equal to occupancy levels for remainder of construction period.
- 1.10.2 Field Measurements: Verify actual dimensions of construction contiguous with architectural wood casework by field measurements before fabrication.

## **1.11 SITE CONDITIONS**

- 1.11.1 Ambient Conditions: Ensure products are stored in climate-controlled areas with functional HVAC system and relative humidity and moisture content values that fall within the following range:
  - 1.11.1.1 Unless indicated otherwise:
    - .1 Moisture Content: 5-10%, Relative Humidity: 25-55%

## **1.12 WARRANTY**

- 1.12.1 Extended warranty: Submit for Owner's review and acceptance, manufacturer's extended warranty in which manufacturer commits to repair or replace components of architectural wood casework that fail within specified warranty period. Manufacturer's extended warranty is in addition to, and does not supersede, any other rights that Owner may have under Contract Documents.
  - 1.12.1.1 Warranty Period: Not less than 3 years from date of Substantial Performance of The work.

# **PART 2 PRODUCTS**

## **2.1 PERFORMANCE / DESIGN CRITERIA**

- 2.1.1 Regulatory Requirements:
  - 2.1.1.1 Provide work in accordance with North American Architectural Woodwork Standards (NAAWS), latest edition, as published by the Architectural Woodwork Association of Canada (AWMAC), unless otherwise specified herein.
  - 2.1.1.2 All references to grades and terminology in this Section refer to grades defined in NAAWS and are incorporated into this Section by reference. Requirements specified in this Section govern and modify NAAWS.
  - 2.1.1.3 Unless indicated otherwise, Provide work of this Section in accordance with following NAAWS grades:
    - .1 Where plastic laminate facing is used: Premium.
    - .2 Where wood veneer or solid wood is used: Premium.

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2.1.2 VOC Content and Emissions:

- 2.1.2.1 VOC Emissions: For applicable items in this Section, comply with CDPH Standard Method v1.2–2017 (CA Spec 01350) and ensure products are certified per UL 2818, SCS Global Gold, or equivalent.
- 2.1.2.2 VOC Content Requirements: Wet-applied materials used in scope of this Section must conform to the following:
  - .1 Paints and Coatings: SCAQMD Rule 1113 or CARB SCM.
  - .2 Adhesives and Sealants: SCAQMD Rule 1168.
  - .3 Methylene chloride and perchloroethylene must not be intentionally added in paints, coatings, adhesives, or sealants.
- 2.1.2.3 Composite Wood (if applicable): must be ULEF or NAF type per CARB ATCM. Do not adhesives that contain urea-formaldehyde.

2.1.3 Design and Performance Requirements:

- 2.1.3.1 Architectural Drawings and details are diagrammatic and are only intended to show design concept, aesthetics, interfacing requirements, configuration, components and arrangements. They are not intended to identify or solve completely problems of thermal and structural movements, assembly framing, engineering design, fixings and anchorages.
- 2.1.3.2 Seismic Performance:
  - .1 Design materials specified in this Section to withstand the effects of earthquake motions determined according to Ontario Building Code and CAN/CSA S832 requirements.
  - .2 Comply with "Section 14 – Installation" clause "14.10 – A – Additional General Seismic Requirements" of NAAWS.
- 2.1.3.3 Ensure architectural wood casework (e.g. wall cabinets, cabinet drawers and similar items) are capable of supporting structural loads without deflection in accordance with Casework Integrity Tests indicated in Appendix A of NAAWS.
  - .1 Minimum nominal thickness and material for cabinet components and shelf deflection, type of materials, thicknesses, span width, and total load distribution must conform to NAAWS "Section 10 - Casework" and be suitable for "schools, hospitals, and library" grades.
- 2.1.3.4 Seal wood surfaces and edges unless indicated otherwise. Exposed wood cores are not permitted.
- 2.1.3.5 Provide cabinets with flush overlay construction.
- 2.1.3.6 Provide architectural wood casework such that no sharp edges are exposed.
- 2.1.3.7 Incorporate required mechanical, electrical and communication services into architectural wood casework so that wires and pipes are hidden from view. Provide access panels to services to allow for future adjustment.

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- 2.1.3.8 Provide built-in valance lighting underneath all upper cupboards over countertops as indicated on Drawings;
- 2.1.3.9 Doors, drawers, and other exposed architectural wood casework edges must be fitted with heat-applied, appropriately-sized ABS or other durable PVC-free edge strips. Plastic laminate-to-plastic laminate edges are not permitted.
- 2.1.3.10 Provide locks for doors and drawers. Final lock locations will be established in consultation with Owner prior to occupancy. Provide locks keyed in accordance with Owner's keying requirements.
- 2.1.3.11 Cores for architectural wood casework must be MDF unless indicated otherwise. At locations subject to moisture, provide veneer core plywood cores and substrates. Do not use veneer core plywood at cabinet door or drawer front components and wall or ceiling panels.
- 2.1.3.12 Provide veneer core plywood with water-resistant adhesives to bottoms of sink cabinet boxes and other areas that may come into contact with water.
- 2.1.3.13 Fire Retardant Treated Materials:
  - .1 Where fire-retardant-treated materials are indicated or required by authorities having jurisdiction, use materials impregnated with fire-retardant chemicals by pressure process or other means acceptable to Consultant to produce Products with flame-spread ratings of less than 25 when tested in accordance to CAN/ULC-S102.
  - .2 Use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes when preservative or fire-retardant treatment is required for exposed items designated to receive a stained or natural finish.

## **2.2 FRAMING LUMBER**

- 2.2.1 As specified in Section 06 10 00, Rough Carpentry.
- 2.2.2 Comply with requirements of "Section 03 – Lumber" of NAAWS.

## **2.3 PANEL PRODUCTS**

- 2.3.1 Comply with requirements of "Section 04 – Sheet Products" of NAAWS.
- 2.3.2 Medium Density Fibreboard Core (MDF): to ANSI A208.2, Grade 155 unless indicated otherwise.
  - 2.3.2.1 Acceptable Products: "NU Green MR50 NAF MDF" by Uniboard or approved equivalent by one of the following:
    - .1 Sierra Pine Ltd
    - .2 Flakeboard Company Limited.
    - .3 Tafisa Canada and Company, Ltd.
- 2.3.3 Veneer Core Plywood:

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- 2.3.3.1 Softwood plywood: Premium Grade, Douglas Fir plywood - CSA O121, or Western Softwood Plywood - CSA O151 or Poplar plywood - CSA O153-M.
- 2.3.3.2 Hardwood Plywood (wood cores): Conforming to ANSI/HPVA HP-1.
- 2.3.3.3 Provide exterior grade, veneer core plywood with moisture-resistant adhesives at locations where sinks are scheduled to be installed and at other locations indicated on Drawings
- 2.3.3.4 Provide veneer core (plywood) at following locations:
  - .1 architectural wood casework cores subject to moisture (where sinks are indicated),
  - .2 cabinet bases in contact with floor,
  - .3 other locations indicated on Drawings and Schedules

## **2.4 PLASTIC LAMINATE (PLAM)**

- 2.4.1 Comply with requirements of "Section 04 – Sheet Products" of NAAWS.
- 2.4.2 Provide high-pressure laminates (HPL) complying with requirements of ANSI/NEMA LD3 or ISO 4526 consisting of multiple layers of thermosetting resin-saturated Kraft paper in combination with a layer of decorative melamine-saturated paper, fused together under heat and pressure.
- 2.4.3 Plastic Laminate (PLAM-#): Refer to Section 09 06 00 - Schedule of Finishes.

## **2.5 PLASTIC-LAMINATE-CLAD CASEWORK**

- 2.5.1 Comply with requirements of "Section 10 – Casework" of NAAWS.
- 2.5.2 Casework Construction Type: Frameless construction with edge banded front edges
- 2.5.3 Interface Style: Flush Overlay unless otherwise indicated.
- 2.5.4 Core for Exposed Surfaces, Semi-Exposed Surfaces and Concealed Surfaces: MDF core unless otherwise indicated.
- 2.5.5 Cladding: high-pressure laminate as follows:
  - 2.5.5.1 Exposed Surfaces:
    - .1 Horizontal Surfaces Other Than Tops: HGP
    - .2 Vertical Surfaces: VGP.
    - .3 Finish: As noted on Millwork Drawings.
  - 2.5.5.2 Semi-Exposed Surfaces:
    - .1 Surfaces Other Than Drawer Bodies: VGP.
    - .2 Drawer Sides and Backs: VGP.
    - .3 Drawer Bottoms: HGP
    - .4 Finish: As noted on Millwork Drawings
  - 2.5.5.3 Concealed Surfaces: BKL; Colour: White

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- 2.5.6 Edgebanding: ABS or other durable PVC-free edgebanding colour-matched to plastic-laminate in colour, pattern, and finish with following minimum thicknesses:
  - 2.5.6.1 Case bodies: minimum 0.5 mm (0.0197") thick,
  - 2.5.6.2 Doors, drawer fronts, and false fronts: minimum 3 mm (1/8") thick.
  - 2.5.6.3 Acceptable Manufacturers: Richelieu Hardware or Wilsonart or approved equivalent.

## **2.6 COUNTERTOPS AND BACKSPLASHES**

- 2.6.1 Comply with requirements of "Section 11 – Countertops and Horizontal Surfaces" of NAAWS.
- 2.6.2 Solid Surface Countertops (SSF-1):
  - 2.6.2.1 Description: Provide cast, nonporous, filled, homogeneous sheets composed of minimum 30% acrylic resin (Polymethyl Methacrylate) and +/- 70% blend of natural minerals with through-body colours, complying with ICPA SS-1.
  - 2.6.2.2 Colours and Patterns: Refer to Section 09 06 00 - Schedule of Finishes.
  - 2.6.2.3 Basis-of-Design: Refer to Section 09 06 00 - Schedule of Finishes.

## **2.7 ARCHITECTURAL WOOD CASEWORK HARDWARE AND ACCESSORIES**

- 2.7.1 Provide stainless steel wood casework hardware meeting or exceeding applicable requirements indicated in ANSI/BHMA A156 Standards for Grade 1 hardware.
- 2.7.2 Slides
  - 2.7.2.1 Light Duty Drawer Slides – 610 mm (24") wide or less, Capacity: 34.02 kg (75 lbs.):
    - .1 Side Mounted Telescoping Ball Bearing drawer slide, 3/4 extension (length as required to suit drawer size); Following products are acceptable: :
      - .1 Model No. Accuride – 2132 by Hafele
      - .2 Model No. KA 3432 – by Hettich
      - .3 Approved equivalent by Knappe & Vogt;
  - 2.7.2.2 Light Duty Drawer Slides – 610 mm (24") wide or less, Capacity: 30 kg (66 lbs.):
    - .1 Under Mounted Telescoping Ball Bearing drawer slide, full extension (length as required to suit drawer size); Following products are acceptable: :
      - .1 "Model No. Tandem slide #560H Series" by Richelieu Hardware
      - .2 Model No. Quadro V6 by Hettich
      - .3 Approved equivalent by Knappe & Vogt; or by Hafele
  - 2.7.2.3 Medium Duty Drawer Slides – 610 mm (24") wide or less, Capacity: 40.82 kg (90 lbs.):

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- .1 Side Mounted Telescoping Ball Bearing drawer slide with full extension and 25 mm (1") over travel (length as required to suit drawer size); Following products are acceptable: :
        - .1 Model No. Accuride – 3834 by Hafele
        - .2 Model No. 8455 by Knappe & Vogt;
        - .3 Model No. KA 5632/1" OT by Hettich
  - 2.7.2.4 Medium Duty Drawer Slides – more than 610 mm (24") wide, Capacity 45.36 kg (100 lbs.)
    - .1 Side Mounted Telescoping Ball Bearing drawer slide with full extension (length as required to suit drawer size); Following products are acceptable: :
      - .1 Model No. Accuride – 3832 by Hafele
      - .2 Model No. 1375 by Knappe & Vogt;
      - .3 Model No. KA 5632 by Hettich
  - 2.7.2.5 Heavy Duty Drawer Slides – more than 610 mm (24") wide, Capacity: 68.04 kg (150 lbs.)
    - .1 Side Mounted Telescoping Ball Bearing drawer slide with full extension and 25 mm (1") over travel (length as required to suit drawer size); Following products are acceptable:
      - .1 Model No. Accuride – 3640 by Hafele
      - .2 Model No. 8505 by Knappe & Vogt;
      - .3 Model No. KA 555 by Hettich
- 2.7.3 Cabinet Door Hinges and Stays:
  - 2.7.3.1 Ensure cabinet hinge pin is not removable (tack weld or cap). Provide hinges complete with one-piece non-removable pin with tapered tips (Hospital Tips)
  - 2.7.3.2 Wood Door Hinges:
    - .1 Frameless Concealed Hinges (European Type): Self-closing concealed hinges with integrated soft close. Manufacturer's recommended number of hinges to suit door size and thickness.
    - .2 Opening angle: Minimum 160o, except Provide 110o at locations adjacent to walls to prevent wall damage.
    - .3 Acceptable Products: "Salice Concealed Hinges 200 and 300 Series" by Hafele or "Blum Concealed - Clip-Top Hinge" by Richelieu Hardware or "Intermat 9943" or "Intermat 9956" by Hettich
- 2.7.4 Door and Drawer Locks:
  - 2.7.4.1 Cylinder Locks: Provide adjustable locking system with lock throw, orientation and size to suit cabinet size. Following products are acceptable:
    - .1 "Cylinder Module System; Model No. 232 Series" by Hafele complete with cam locks or deadbolt locks and cores as required to suit applications indicated.

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- .2 "Disc Tumbler Furniture Locks - Removacore" by CompX National complete with cam locks or deadbolt locks and cores as required to suit applications indicated
- 2.7.5 Handles (Doors and Drawers):
  - 2.7.5.1 D-Pulls (HP-#): stainless steel modern bar pull with length and projection as specified on Schedule of Finishes.
  - 2.7.5.2 Basis-of-Design: Refer to Section 09 06 00 - Schedule of Finishes.
- 2.7.6 Recessed Shelf Pilasters, Standards and Clips: Provide required accessories to mount wood or glass shelves. Following products are acceptable:
  - 2.7.6.1 "LOGO III Glass Shelf Support - # 864219210"; Finish: Aluminum Gray by Richelieu Hardware.
- 2.7.7 Drawer and Hinged Door Bumpers: Provide 2 clear resilient, press-fit bumpers per door or drawer.

## **2.8 FINISHES**

- 2.8.1 Comply with requirements of "Section 05 – Finishing" of NAAWS.
- 2.8.2 Factory Finishing: As far as practical, ensure casework is factory finished unless otherwise indicated or unavoidable.
  - 2.8.2.1 Defer only final touch-up, cleaning, and polishing until after installation.
  - 2.8.2.2 Touch up finishing work specified in this Section after installation of wood casework. Fill nail holes with matching filler where exposed.
- 2.8.3 Provide NAAWS System – 5, Varnish, Conversion or System – 7, Vinyl, Catalyzed finish unless indicated otherwise.
- 2.8.4 If staining is required or specified, match Consultant's control sample.
- 2.8.5 Prime unexposed surfaces including backs of casework elements that are against walls and their underside.

## **2.9 FABRICATION**

- 2.9.1 Fabricate joints accurately fitted, coped where possible, and well glued up. Fabricate joints mitered to proper fit and with alignments carefully matched.
- 2.9.2 Fabricate finished wood casework in single pieces where possible. Fabricate running members in longest practicable lengths.
- 2.9.3 Conceal fastenings. Set nails and countersink screws and apply matching wood filler to indentations. Sand smooth and leave ready to receive finish.
- 2.9.4 Fabricate exposed gables to match adjacent exposed finishes. Ensure adjacent parts of continuous facing work match in colour and pattern.
- 2.9.5 Install cabinet hardware for doors, shelves and drawers in shop. Recess shelf standards unless noted otherwise.
- 2.9.6 Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes and other fixtures. Coordinate with other Divisions.

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- 2.9.7 Shop-assemble work for delivery to site in size that can be easily handled and to ensure passage through building openings.
- 2.9.8 Apply plastic-laminate or wood veneer (as applicable) to core materials in accordance with adhesive manufacturer's instructions. Ensure core and laminate profiles coincide to provide continuous support and bond over entire surface.
- 2.9.9 Provide balanced construction. Apply backing sheet to reverse side of cores.
- 2.9.10 Replace, rework and refinish components that do not meet NAAWS requirements for grades specified herein at no additional cost to Owner.

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION**

- 3.1.1 Verify actual site conditions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.
- 3.1.2 Verify that shop-fabricated work is ready for installation. Complete additional work as required, such as packing removal and back priming, before installing architectural wood casework.
- 3.1.3 Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

#### **3.2 PREPARATION**

- 3.2.1 Before installation, condition wood casework to average prevailing humidity conditions in installation areas.

#### **3.3 INSTALLATION**

- 3.3.1 Installation, generally: Install work of this Section in strict accordance with manufacturer's written installation instructions and reviewed Shop Drawings. Supplement manufacturer's installation instructions with additional installation requirements specified in this Section to produce specified work results.
- 3.3.2 Comply with requirements of "Section 14 – Installation" of NAAWS and other applicable requirements in corresponding product sections of NAAWS.
- 3.3.3 Assemble wood casework and complete fabrication at site to comply with fabrication requirements specified herein.
- 3.3.4 Scribe and cut wood casework to fit adjoining work. Refinish cut surfaces, and repair damaged finish at cuts. Mitre exposed corners and butt joints.
- 3.3.5 Anchor wood casework to built-in anchors or blocking or directly to substrates in order to thoroughly fix and anchor Work of this Section into position.
- 3.3.6 Secure wood casework with countersunk, concealed fasteners and blind nailing as required for complete installation. Provide heavy duty fixture attachments for wall mounted cabinets.



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- 3.3.7 Use fine finishing nails or finishing screws, countersunk and filled flush with wood casework, for exposed fastening (where permitted), and matching final finish if transparent finishes are specified.
- 3.3.8 Scribe and cut as required to fit abutting walls and to fit properly into recesses and to accommodate piping, columns, fixtures, outlets or other projecting, intersecting or penetrating objects.
- 3.3.9 Cabinetry:
  - 3.3.9.1 Install cabinets without distortion to ensure doors and drawers fit openings properly, and are accurately aligned.
  - 3.3.9.2 Adjust hardware to center doors and drawers in openings and to provide unencumbered operation.
  - 3.3.9.3 Install cabinets with no more than 3 mm in 2400 mm (1/8" in 8'-0") sag, bow, or other variation from straight line
  - 3.3.9.4 Maintain sequence matching of cabinets for plastic-laminate or wood veneer facings, and in accordance with NAAWS grade specified.
  - 3.3.9.5 Fasten wall cabinets with toggle bolts through metal backing or metal framing behind wall finishes through their back, near top and bottom, at ends, and at no more than 400 mm (16") o.c.
- 3.3.10 Hardware and Accessories:
  - 3.3.10.1 Install architectural wood casework hardware in accordance with NAAWS requirements and manufacturer's templates.
  - 3.3.10.2 Fit hardware accurately and securely in accordance with manufacturer's written instructions.
  - 3.3.10.3 Adjust architectural wood casework hardware to provide smooth operation and ensure clearances are maintained.
  - 3.3.10.4 Provide lubricants required and use in manner to ensure smooth function of hardware consistent with manufacturer's recommendations.
- 3.3.11 Mechanical and Electrical Fittings:
  - 3.3.11.1 Provide openings required to accommodate mechanical and electrical fittings as part of the Work of this Section.
  - 3.3.11.2 Locate and Install lenses where indicated.
  - 3.3.11.3 Mount lenses perfectly level or plumb.
  - 3.3.11.4 Ensure lenses fit tightly without showing space or light leak between frame and lenses.
  - 3.3.11.5 Refer to Divisions 21, 22 23, 26, 27 and 28 for additional requirements.

### **3.4 TOLERANCES**

- 3.4.1 Comply with requirements of "Section 15 – Tolerances" of NAAWS.

### **3.5 PROTECTION**

- 3.5.1 Protect architectural wood casework from damage, soiling and contaminating substances resulting from construction activities or caused by work of other trades.

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- 3.5.2 Where soiling or spills have occurred, remove spills and soiling from adjacent surfaces using cleaning procedures recommended in writing by affected material's manufacturer. Do not use materials or process that can damage finishes, surfaces, or construction.
- 3.5.3 Promptly replace architectural wood casework work damaged during construction that cannot be satisfactorily repaired.

### **3.6 ADJUSTING, CLEANING AND WASTE MANAGEMENT**

- 3.6.1 Cleaning and Waste Management, generally: in accordance with Section 01 74 00, Cleaning and Waste Management.
- 3.6.2 Cleaning: Maintain clean construction area at the end of each day. When activities of this Section are complete, remove materials, tools, equipment and rubbish.
- 3.6.3 Clean wood casework on exposed and semi-exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.
- 3.6.4 Repair damaged and defective wood casework, where possible, to eliminate functional and visual defects.
- 3.6.5 Where repair is not possible or practical, replace wood casework to satisfaction of Consultant and at no cost to Owner.
- 3.6.6 Adjust joinery for uniform appearance.
- 3.6.7 Clean, lubricate, and adjust moving and operating parts to function smoothly and correctly.
- 3.6.8 Waste Management and Disposal: sort waste for reuse, recycling, or disposal, as specified. Remove recycling bins and containers from site and dispose of contents at the appropriate waste disposal facilities.

**END OF SECTION**

## **PART 1      GENERAL**

### **1.1      GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.
- 1.1.2 Contractor is solely responsible for dividing the Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of the Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2      SUMMARY**

- 1.2.1 Provide labour, materials, Products, equipment and services to complete the spray-applied fireproofing work specified herein. This includes, but is not necessarily limited, to:
  - 1.2.1.1 Spray-applied fire resistive materials (SFRM) to building elements.
  - 1.2.1.2 Auxiliary materials required for a complete installation.
- 1.2.2 Related Requirements: Specifications throughout all Divisions of the Project shall be read as a whole, and may be directly applicable to this Section.

### **1.3      REFERENCES**

- 1.3.1 Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply.

### **1.4      ADMINISTRATIVE REQUIREMENTS**

- 1.4.1 Pre-installation Meetings: Schedule and hold a pre-installation meeting at the Project site before beginning work on this Section to coordinate activities with related Subcontractors.
  - 1.4.1.1 Notification: Where Consultant attendance is required; minimum 72 hour notice is required.
  - 1.4.1.2 Reporting: Record significant discussions, agreements, and disagreements, including required corrective measures and actions.
  - 1.4.1.3 Distribution: Distribute minutes of the meeting to each party present and to other parties requiring information not more than 72 hours after meeting.
- 1.4.2 Coordination and Sequencing:
  - 1.4.2.1 Metal Roof Deck Substrates: Do not apply fireproofing to metal roof deck substrates until concrete fill (if any) and roofing operations are completed.
    - .1 Do not permit roof traffic during the application and drying of fireproofing.

- 1.4.2.2 Metal Floor Deck Substrates Do not apply fireproofing to metal floor deck substrates until concrete fill is completed.
- 1.4.2.3 Ensure clips, hangers, supports, sleeves, and other items penetrating fire protection are in place before applying fireproofing.
- 1.4.2.4 Defer installation of ducts, piping, and other items that would interfere with the application of fireproofing until the fireproofing application is completed.
- 1.4.2.5 Do not install enclosing or concealing construction until after fireproofing has been applied, inspected, tested, and corrections have been made to defective applications.

## **1.5 SUBMITTALS**

- 1.5.1 Submittals, generally: in accordance with Section 01 33 00, Submittal Procedures.
- 1.5.2 Product Data: Submit manufacturer's product characteristics, catalogue cuts, installation instructions and other relevant information for each material and product used for spray-applied fireproofing work specified in this Section.
- 1.5.3 Shop Drawings: Submit Shop Drawings detailing material layouts, construction details, connections, and relationships with adjacent construction.
  - 1.5.3.1 Schedule: Include a schedule for each building element receiving spray fireproofing, showing the hourly rating, material thickness, and cUL or ULC Design Number.
  - 1.5.3.2 Design Adjustments: For beams and columns differing in size from those listed in the cUL or ULC Design, provide an engineering judgment of thickness adjustments based on W /D formulas for each element. Engineering judgment must be performed by a Professional Engineer.
  - 1.5.3.3 Indicate locations and types of surface preparations required before applying sprayed fireproofing. Indicate treatment of fireproofing after application.
- 1.5.4 Environmental and Material Transparency:
  - 1.5.4.1 Embodied Carbon / EPDs: When available, Submit EPDs conforming to ISO 14025 or equivalent standard; prioritize products with such documentation when choices are at Contractor's option.
  - 1.5.4.2 Material Ingredient Disclosure: When available, submit documentation identifying chemical inventories of materials to at least 0.1% (1000ppm) in accordance with HPD Open Standard, Cradle to Cradle (Basic v2/Bronze v3), ILFI Declare, or equivalent standard; products with such documentation when choices are at Contractor's option.

## **1.6 CLOSEOUT SUBMITTALS**

- 1.6.1 Warranty Documentation: Submit copy of extended warranties specified in this Section.

**1.7 QUALITY ASSURANCE**

- 1.7.1 Manufacturer Qualifications: Provide Products for work of this Section by manufacturer with at least 10 years' experience manufacturing such materials.
- 1.7.2 Installer Qualifications: Engage an entity with sufficient experience installing, erecting, or assembling work similar in material, design, and extent to that shown on Drawings and Schedules, and whose work has resulted in construction with a track record of successful in-service performance.
  - 1.7.2.1 The manufacturer's willingness to sell sprayed fireproofing to a contractor or installer does not qualify the buyer as an experienced installer.
- 1.7.3 Single Source Responsibility: Obtain primary materials for this Section from a single source by a single manufacturer, and secondary materials from sources recommended by manufacturers of primary materials.
- 1.7.4 First Installation Review: Construct sample installations to verify selections made under submittals, demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
  - 1.7.4.1 Location: In-situ (i.e. first installation), as directed on site by Consultant.
  - 1.7.4.2 Purpose: To set benchmarks for installation and to judge subsequent work. Maintain such sample installations during construction in undisturbed condition.
  - 1.7.4.3 Preconstruction Testing Service: Engage a qualified testing agency to conduct preconstruction testing on field mockups of fireproofing.
    - .1 Provide test specimens and assemblies that represent proposed materials and construction methods.
    - .2 Bond Strength: Test cohesive and adhesive strength in accordance with ASTM E736.
    - .3 Density: Test density in accordance with ASTM E605.
    - .4 Compatibility: Verify that the manufacturer attests, through laboratory testing or field experience, that primers or coatings are compatible with fireproofing material.
    - .5 Testing Schedule: Schedule sufficient time for testing and analyzing results to avoid delaying the Work.
    - .6 Corrective Measures: For materials that fail tests, obtain written instructions from the fireproofing manufacturer for corrective measures, including the use of specially formulated bonding agents or primers.
  - 1.7.4.4 Reviewed Sample Installations: May become part of the completed work if undisturbed at the time of Substantial Performance of The work, provided they comply with requirements outlined in Contract Documents.

**1.8 DELIVERY, STORAGE AND HANDLING**

- 1.8.1 Product Requirements, generally: in accordance with Section 01 61 00, Common Product Requirements.
- 1.8.2 Deliver, store and handle spray-applied fireproofing materials in accordance with manufacturer's written instructions. Deliver materials to site in original factory packaging, labelled with manufacturer's name and address. Store materials in off-ground, in clean, dry, well-ventilated area. Replace defective or damaged materials with new.
- 1.8.3 Use materials with limited shelf life within period indicated. Remove from Project site and discard materials whose shelf life has expired.
- 1.8.4 Store materials inside, under cover, aboveground, in a dry location, until ready for use. Remove from Project site and discard wet or deteriorated materials.

**1.9 FIELD CONDITIONS**

- 1.9.1 Environmental Restrictions: Do not apply fireproofing when ambient or substrate temperature is 5 deg C (41 deg F) or lower unless temporary protection and heat are provided to maintain temperature at or above this level for 24 hours before, during, and for 24 hours after product application.
- 1.9.2 Ventilation: Ventilate building spaces during and after application of fireproofing, providing complete air exchanges according to manufacturer's written instructions. Use natural means or, if they are inadequate, forced-air circulation until fireproofing dries thoroughly.
- 1.9.3 Provide temporary enclosures for interior applications to prevent deterioration of fireproofing due to exposure to unfavorable environmental conditions.

**1.10 WARRANTY**

- 1.10.1 Extended warranty: Submit for Owner's review and acceptance, manufacturer's extended warranty in which manufacturer commits to repair or replace components of spray-applied fireproofing that fail within specified warranty period. Manufacturer's extended warranty is in addition to, and does not supersede, any other rights that Owner may have under Contract Documents.

**PART 2 PRODUCTS****2.1 MANUFACTURERS**

- 2.1.1 Provided requirements of Contract Documents are satisfied, the following manufacturers may supply Products for work this Section:
  - 2.1.1.1 Carboline Company.
  - 2.1.1.2 GCP Applied Technologies Inc.
  - 2.1.1.3 Isolatek International (Cafco)

## **2.2 PERFORMANCE / DESIGN CRITERIA**

- 2.2.1 Fire-Resistance Ratings: to CAN/ULC S101 and OBC 3.1.7 "Fire Resistance Rating" with rating determined by a qualified agency acceptable to authorities having jurisdiction.
- 2.2.2 All materials must be asbestos-free.
- 2.2.3 Physical characteristics: Unless indicated otherwise, fireproofing must have the following minimum physical characteristics:
  - 2.2.3.1 Density: As specified.
  - 2.2.3.2 Fire-rating: As noted on Drawings.
  - 2.2.3.3 Thickness: as required to meet fire-resistance rating, but not less than 9 mm (0.375 inch) ASTM E605.
  - 2.2.3.4 Surface-Burning Characteristics: to CAN/ULC S102.
    - .1 Flame-Spread Index: 0.
    - .2 Smoke-Developed Index: 0.
  - 2.2.3.5 Compressive Strength: Minimum 68.9 kPa (10 psi) to ASTM E761.
  - 2.2.3.6 Corrosion Resistance: No evidence of corrosion to ASTM E937.
  - 2.2.3.7 Deflection: No cracking, spalling, or delamination to ASTM E759.
  - 2.2.3.8 Air Erosion: Maximum weight loss of 0 g/sq. m (0 g/sq. ft.) in 24 hours to ASTM E859.
  - 2.2.3.9 Fungal Resistance: Treat to prevent growth to ASTM G21.
- 2.2.4 Load Restrictions: Fireproofing systems to be considered unrestrained unless specifically noted otherwise. Do not use "Load Restricted" beam or joist designs unless specified otherwise.
- 2.2.5 Engineered Judgments: For untested assemblies, propose designs based on accepted engineering criteria. Submit designs bearing seal of professional engineer responsible for their preparation.
- 2.2.6 Accessories: Provide accessories that comply with base fireproofing material manufacturer's recommendations for bonding agents, binders, accessories, solvents, aggregates, and sealers.
- 2.2.7 Low-Emitting Materials: Coatings shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

## **2.3 MEDIUM DURABILITY FIREPROOFING**

- 2.3.1 Description: Manufacturer's standard, factory-mixed, Portland cement-based dry formulation mixed with water at the Project site to form a slurry or mortar before conveyance and application.
- 2.3.2 Bond Strength: Minimum 94.5 kPa (2,000 psf) cohesive and adhesive strength based on field testing per ASTM E736.
- 2.3.3 Density: Minimum 350 kg/m<sup>3</sup> (22 pcf) as specified in the fire-resistance design, according to ASTM E605.

- 2.3.4 Sealer: Provide manufacturer's standard transparent-drying, water-dispersible, tinted protective coating recommended in writing by fireproofing manufacturer for location specified.
  - 2.3.4.1 Colour: In exposed locations, provide manufacturer's standard light-grey colour.
- 2.3.5 Application: Interior fireproofing for structural components in mechanical rooms, elevator shafts, storage areas, and locations exposed to abrasion.
- 2.3.6 Acceptable Products:
  - 2.3.6.1 "Monokote Z-106/HY" by GCP-Applied Technologies
  - 2.3.6.2 "CAFCO 400" or "CAFCO® BLAZE-SHIELD® HP" by Cafco Industries
  - 2.3.6.3 "Southwest Type 7GP" by Caroboline

## **2.4 IMPACT-RESISTANT FIREPROOFING**

- 2.4.1 Description: Manufacturer's standard, factory-mixed, Portland cement-based dry formulation mixed with water at the Project site to form a slurry or mortar before conveyance and application.
- 2.4.2 Bond Strength: Minimum 478-kPa (10,000 psf) cohesive and adhesive strength based on field testing according to ASTM E736.
- 2.4.3 Density: Not less than 640 kg/cu. m (40 pcf) and as specified in the approved fire-resistance design, according to ASTM E605.
- 2.4.4 Application: Interior or exterior fireproofing for structural components in garage areas or locations subject to impact.
- 2.4.5 Sealer: Provide manufacturer's standard transparent-drying, water-dispersible, tinted protective coating recommended in writing by fireproofing manufacturer for location specified.
  - 2.4.5.1 Colour: In exposed locations, provide manufacturer's standard light-grey colour.
- 2.4.6 Acceptable Products:
  - 2.4.6.1 "Monokote Z-146" or "Monokote Z-156" by GCP-Applied Technologies
  - 2.4.6.2 "Fendolite M-II" by Cafco Industries Inc.,
  - 2.4.6.3 "Southwest Type 7HD" by Caroboline

## **2.5 AUXILIARY MATERIALS**

- 2.5.1 Provide auxiliary materials that are compatible with fireproofing and substrates. Ensure materials are approved by ULC, UL, or another testing and inspecting agency acceptable to authorities having jurisdiction for use in fire-resistance designs indicated.
- 2.5.2 Substrate Primers: primers approved by the fireproofing manufacturer and complying with the following:
  - 2.5.2.1 Primer and substrate must be identical to those tested in the required fire-resistance design.
  - 2.5.2.2 Primer's bond strength in required fire-resistance design must comply with specified bond strength for fireproofing and requirements in ULC's



"Fire Resistance Directory" or other qualified listings, based on ASTM E736 bond tests.

- 2.5.3 Metal Lath: Where required, provide expanded metal lath as specified in fire-resistance designs indicated on and fireproofing manufacturer's recommendations. Include necessary clips, lathing accessories, corner beads, and other anchorage devices for attaching lath to substrates and to receive fireproofing.
- 2.5.4 Reinforcing Fabric: Provide glass- or carbon-fiber fabric that complies with fire-resistance designs specified. Ensure fabric is approved and provided by fireproofing manufacturer.
- 2.5.5 Reinforcing Mesh: Metallic mesh reinforcement of type, weight, and form required to comply with fire-resistance design indicated and approved and provided by fireproofing manufacturer. Include pins and attachment.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- 3.1.1 Verify actual site conditions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.
  - 3.1.1.1 Substrates are free of dirt, oil, grease, release agents, rolling compounds, mill scale, loose scale, incompatible primers, paints, and encapsulants, or other foreign substances capable of impairing bond of fireproofing with substrates under conditions of normal use or fire exposure.
  - 3.1.1.2 Objects penetrating fireproofing, including clips, hangers, support sleeves, and similar items, are securely attached to substrates.
  - 3.1.1.3 Substrates receiving fireproofing are not obstructed by ducts, piping, equipment, or other suspended construction that will interfere with fireproofing application.
- 3.1.2 Verify that concrete work on steel deck has been completed before beginning fireproofing work.
- 3.1.3 Verify that roof construction, installation of roof-top HVAC equipment, and other related work is complete before beginning fireproofing work.
- 3.1.4 On structural steel members to receive sprayed fire resistive materials, ensure corrosion protection primers and galvanized primers are not applied. If primed surfaces cannot be avoided, ensure primers are compatible with fireproofing materials and bond requirements.
- 3.1.5 Conduct tests according to fireproofing manufacturer's written recommendations to verify that substrates are free of substances capable of interfering with bond.
- 3.1.6 Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

- 3.1.7 Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 PREPARATION**

- 3.2.1 Cover other work subject to damage from fallout or overspray of fireproofing materials during application.
- 3.2.2 Clean substrates of substances that could impair bond of fireproofing.
- 3.2.3 For applications visible on completion of Project, repair substrates to remove surface imperfections that could affect uniformity of texture and thickness in finished surface of fireproofing. Remove minor projections and fill voids that would telegraph through fire-resistive products after application.
- 3.2.4 Existing Painted Steel Beams and Column Surfaces
  - 3.2.4.1 Ensure existing painted and/or primed steel surfaces requiring fireproofing meet UL and ULC requirements for application and adhesion. Obtain certifications from fireproofing manufacturer confirming compatibility of fireproofing with paint systems.
  - 3.2.4.2 Painted Steel Decking: If coating on steel decking is not factory-installed with a UL or ULC Certification for fireproofing compliance, provide and install diamond mesh metal lath over entire surface of the deck before applying fireproofing. Ensure the metal lath is mechanically fastened.

### **3.3 INSTALLATION**

- 3.3.1 Installation, generally: Install work of this Section in strict accordance with manufacturer's written installation instructions and reviewed Shop Drawings. Supplement manufacturer's installation instructions with additional installation requirements specified in this Section to produce specified work results.
- 3.3.2 Construct fireproofing assemblies that are identical to fire-resistance design indicated on Drawings and Schedules and products as specified, tested, and substantiated by test reports; for thickness, primers, sealers, topcoats, finishing, and other materials and procedures affecting fireproofing work.
- 3.3.3 Comply with fireproofing manufacturer's written instructions for mixing materials, application procedures, and types of equipment used to mix, convey, and apply fireproofing; as applicable to particular conditions of installation and as required to achieve fire-resistance ratings indicated on Drawings and Schedules.
- 3.3.4 Coordinate application of fireproofing with other construction to minimize need to cut or remove fireproofing.
  - 3.3.4.1 Do not begin applying fireproofing until clips, hangers, supports, sleeves, and other items penetrating fireproofing are in place.
  - 3.3.4.2 Defer installing ducts, piping, and other items that would interfere with applying fireproofing until application of fireproofing is completed.
- 3.3.5 Metal Decks:
  - 3.3.5.1 Do not apply fireproofing to underside of metal deck substrates until concrete topping, if any, has been completed.

- 3.3.5.2 Do not apply fireproofing to underside of metal roof deck until roofing has been completed; prohibit roof traffic during application and drying of fireproofing.
- 3.3.6 Install auxiliary materials as required, as detailed, and according to fire-resistance design and fireproofing manufacturer's written recommendations for conditions of exposure and intended use. For auxiliary materials, use attachment and anchorage devices of type recommended in writing by fireproofing manufacturer.
- 3.3.7 Spray apply fireproofing to maximum extent possible. Following the spraying operation in each area, complete the coverage by trowel application or other placement method recommended in writing by fireproofing manufacturer.
- 3.3.8 Extend fireproofing in full thickness over entire area of each substrate to be protected.
- 3.3.9 Install body of fireproofing in a single course unless otherwise recommended in writing by fireproofing manufacturer.
- 3.3.10 For applications over encapsulant materials, including lockdown (post-removal) encapsulants, apply fireproofing that differs in colour from that of encapsulant over which it is applied.
- 3.3.11 Where sealers are used, apply products that are tinted to differentiate them from fireproofing over which they are applied.
- 3.3.12 Provide a uniform finish complying with description directed on Site for each type of fireproofing material and matching finish approved for required mockups.
- 3.3.13 Cure fireproofing according to fireproofing manufacturer's written recommendations.
- 3.3.14 Do not install enclosing or concealing construction until after fireproofing has been applied, inspected, and tested and corrections have been made to deficient applications.

### **3.4 FIELD QUALITY CONTROL**

- 3.4.1 Inspections: Owner will engage a qualified special inspector to perform the following inspections:
  - 3.4.1.1 Test and inspect as required in accordance with AWCI Manual 12A.
- 3.4.2 Perform the tests and inspections of completed Work in successive stages. Do not proceed with application of fireproofing for the next area until test results for previously completed applications of fireproofing show compliance with requirements. Tested values must equal or exceed values as specified and as indicated on Drawings and Schedules and required for approved fire-resistance design.
- 3.4.3 Fireproofing will be considered defective if it does not pass tests and inspections.
- 3.4.4 Remove and replace fireproofing that does not pass tests and inspections, and retest.
- 3.4.5 Apply additional fireproofing, per manufacturer's written instructions, where test results indicate insufficient thickness, and retest.

3.4.6 Prepare test and inspection reports.

### **3.5 PROTECTION**

- 3.5.1 Protect spray-applied fireproofing from damage, soiling and contaminating substances resulting from construction activities or caused by work of other trades.
- 3.5.2 Do not permit unnecessary exposure of fireproofing to abrasion and other damage during subsequent construction operations.
- 3.5.3 Where soiling or spills have occurred, remove spills and soiling from adjacent surfaces using cleaning procedures recommended in writing by affected material's manufacturer. Do not use materials or process that can damage finishes, surfaces, or construction.
- 3.5.4 Promptly replace spray-applied fireproofing work damaged during construction that cannot be satisfactorily repaired.

### **3.6 CLEANING AND WASTE MANAGEMENT**

- 3.6.1 Cleaning: Maintain clean construction area at the end of each day. When activities of this Section are complete, remove materials, tools, equipment and rubbish.
- 3.6.2 Waste Management and Disposal: sort waste for reuse, recycling, or disposal, as specified. Remove recycling bins and containers from site and dispose of contents at the appropriate waste disposal facilities.

**END OF SECTION**

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## **PART 1      GENERAL**

### **1.1      GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.
- 1.1.2 Contractor is solely responsible for dividing the Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of the Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2      SUMMARY**

- 1.2.1 Provide labour, materials, Products, equipment and services to complete the firestopping and smoke seals work specified herein. This includes, but is not necessarily limited, to:
  - 1.2.1.1 Through-penetration firestops.
  - 1.2.1.2 Membrane penetration firestops.
  - 1.2.1.3 Blank opening firestops.
  - 1.2.1.4 Construction joint firestops.
  - 1.2.1.5 Building perimeter firestops.
  - 1.2.1.6 Auxiliary materials required for a complete installation.
- 1.2.2 Related Requirements: Specifications throughout all Divisions of the Project shall be read as a whole, and may be directly applicable to this Section.

### **1.3      REFERENCES**

- 1.3.1 Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply.

### **1.4      DEFINITIONS**

- 1.4.1 Fire Blocking: materials, components or system installed in a concealed space in the building to restrict the spread of fire and smoke in that concealed space or from that concealed space to an adjacent space.
- 1.4.2 Firestop: a material, component or system, and its means of support, used to protect gaps between fire separations, between fire separations and other construction assemblies, or used in openings where penetrating items wholly or partially penetrate fire separations, to restrict the spread of fire and smoke thus maintaining the fire-resistance continuity of a fire separation.
- 1.4.3 Firestop System: the combination of specific materials and/or devices required with the penetrating item(s), the assembly and the opening to assemble the firestop.

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- 1.4.4 Intumescent: materials that expand with heat to prevent fire spread through fire separations.
- 1.4.5 Listed Firestop System: a specific field erected construction consisting of the assembly, firestop materials, any penetrating items and their means of support which have met the requirements for an F, FT, FH, FTH and/or L rating when tested in a fire-resistance rated assembly in accordance CAN/ULC-S115-18.
  - 1.4.5.1 F-Rating: the amount of time a firestop system can remain in place without the passage of flame through the opening or the occurrence of flaming on the unexposed face of the firestop.
  - 1.4.5.2 FT-Rating: a firestop system with an F-Rating for the required time period which can also resist the transmission of heat through the firestop during the same period and limit the rise in temperature on the unexposed face and/or penetrating item of the firestop.
  - 1.4.5.3 FH-Rating: a firestop system with an F-Rating for the required time period which can also resist the force of a hose stream without developing openings for a prescribed period.
  - 1.4.5.4 FTH-Rating: a firestop system with an FT-Rating for the required time period which also passed the hose stream test for a prescribed period.
  - 1.4.5.5 L-Rating: largest test sample leakage rate, determined in accordance with CAN/ULC-S115.
- 1.4.6 Multi-penetration: two or more service penetrations through an opening in the fire separation.
- 1.4.7 Non-rated Fire Separation: fire separation acting as a barrier to the spread of smoke until a response is initiated such as the activation of a fire suppression system.
- 1.4.8 Single-penetration: single service penetration through an opening in the fire separation.
- 1.4.9 System Design Listing: document providing proof of testing with technical details, specifications and requirements that leads to the application of a specific listed firestop system.
- 1.4.10 Dry location or area: A location not normally subject to dampness.
- 1.4.11 Damp/wet location or area: Exterior or interior location that is normally or periodically subject to condensation of moisture in, on, or adjacent to, Work of this Section. This includes location in which water or other liquid can drip, splash, or flow on or against Work of this Section.

## **1.5 ADMINISTRATIVE REQUIREMENTS**

- 1.5.1 Pre-installation Meetings: Schedule and hold a pre-installation meeting at the Project site before beginning work on this Section to coordinate activities with related Subcontractors.
  - 1.5.1.1 Notification: Where Consultant attendance is required; minimum 72 hour notice is required.

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- 1.5.1.2 Reporting: Record significant discussions, agreements, and disagreements, including required corrective measures and actions.
- 1.5.1.3 Distribution: Distribute minutes of the meeting to each party present and to other parties requiring information not more than 72 hours after meeting.
- 1.5.2 Sequencing:
  - 1.5.2.1 Proceed with installation only when submittals have been reviewed by Consultant.
  - 1.5.2.2 Install firestops in floor assemblies before erecting interior partitions.
  - 1.5.2.3 Unless noted otherwise on system design listing and manufacturer's installation instructions, ensure firestopping precedes spray applied fireproofing to ensure proper bonding.
  - 1.5.2.4 Ensure pipe and duct insulation installation precedes firestopping.
- 1.5.3 Coordination:
  - 1.5.3.1 Coordinate construction of openings and penetrating items to ensure that Firestopping and smoke seals is installed according to specified requirements.
  - 1.5.3.2 Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate Firestopping and smoke seals.
  - 1.5.3.3 Ensure Shop Drawings for firestopping and smoke seals inside sealed mechanical and electrical assemblies are reviewed by Divisions 21, 22, 23 and 26 respectively.
  - 1.5.3.4 Do not cover up firestopping and smoke seal installations that will become concealed behind other construction until each installation has been examined by inspection and testing agency and authorities having jurisdictions as required.

## **1.6 SUBMITTALS**

- 1.6.1 Submittals, generally: in accordance with Section 01 33 00, Submittal Procedures.
- 1.6.2 Product Data: Submit manufacturer's product characteristics, catalogue cuts, installation instructions and other relevant information for each material and product used for firestopping and smoke seals work specified in this Section.
- 1.6.3 Firestopping Schedule: Submit a firestopping schedule including the following information:
  - 1.6.3.1 The type of through-penetration firestop system to be installed for each penetration.
  - 1.6.3.2 Each construction condition penetrated.
  - 1.6.3.3 Each kind of penetrating item.
  - 1.6.3.4 ULC or cUL firestop design designation that demonstrates compliance with specified requirements for each condition indicated.
  - 1.6.3.5 Submit documentation, including illustrations, from cUL / ULC applicable to each firestop system listed in schedule.

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- 1.6.4 Engineering Judgments (EJ): Submit an EJ from the system manufacturer if no listed systems are available from the manufacturer specified or from other manufacturers listed in this Specification.
  - 1.6.4.1 Prepare and submit an EJ according to the best practices established in the following documents:
    - .1 IFC Guidelines for Evaluating Engineering Judgments.
    - .2 IFC Guidelines for Evaluating Engineering Judgments - Perimeter Fire Barrier Systems.
  - 1.6.4.2 Each EJ submission must include:
    - .1 Project name, number, and location.
    - .2 Description of the proposed system with a detailed drawing.
    - .3 Installation instructions.
    - .4 Complete descriptions of critical elements for the firestop configuration.
    - .5 Copies of all referenced system design listings on which the EJ is based.
    - .6 EJ issuer name and contact information.
    - .7 Date of issue with authorization signature of the issuer.
    - .8 Manufacturer's letter stating their opinion, with supporting justification, that the EJ will perform as a firestop system if subjected to the appropriate standard fire test method for the required fire rating duration.
  - 1.6.4.3 Once reviewed, submit the EJ to the authority having jurisdiction for final approval.
- 1.6.5 Environmental and Material Transparency:
  - 1.6.5.1 Embodied Carbon / EPDs: When available, Submit EPDs conforming to ISO 14025 or equivalent standard; prioritize products with such documentation when choices are at Contractor's option.
  - 1.6.5.2 Material Ingredient Disclosure: When available, submit documentation identifying chemical inventories of materials to at least 0.1% (1000ppm) in accordance with HPD Open Standard, Cradle to Cradle (Basic v2/Bronze v3), ILFI Declare, or equivalent standard; products with such documentation when choices are at Contractor's option.

## **1.7 CLOSEOUT SUBMITTALS**

- 1.7.1 Operating and Maintenance Data: Submit care and maintenance instructions for firestopping and smoke seals to be included in building operation and maintenance manual. Include:
  - 1.7.1.1 WHMIS Safety Data Sheets (SDS).
  - 1.7.1.2 Product data and manufacturer's installation and maintenance instructions for each product/system used on this project.
  - 1.7.1.3 Approved system design listings and Engineering Judgments.



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- 1.7.1.4 Matrix schedule listing all system design listings and Engineering Judgments with a description of their penetration or joint type.
- 1.7.1.5 Manufacturer's field reports.
- 1.7.1.6 Warranty information on firestop installations.
- 1.7.2 As-built Drawings: Submit marked-up set of drawings to indicating the following:
  - 1.7.2.1 Locations of each firestop identified.
  - 1.7.2.2 Penetration identification numbers.
  - 1.7.2.3 Detailed drawings of system design listings for each type of firestop (through-penetration, membrane penetration, blank opening, construction joint, building perimeter).
- 1.7.3 Closeout Firestop Schedules: submit a list of systems installed, the cUL / ULC design designations, and the location of each system.
  - 1.7.3.1 Cross-reference firestop schedules with as-built drawings and indicate design listing numbers associated to each penetration firestop and joint firestop.
- 1.7.4 Warranty Documentation: Submit copy of extended warranties specified in this Section.

## **1.8 QUALITY ASSURANCE**

- 1.8.1 Manufacturer Qualifications: Provide Products for work of this Section by manufacturer with at least 10 years' experience manufacturing such materials.
- 1.8.2 Installer Qualifications:
  - 1.8.2.1 Engage an entity with sufficient experience installing, erecting, or assembling work similar in material, design, and extent to that shown on Drawings and Schedules, and whose work has resulted in construction with a track record of successful in-service performance.
  - 1.8.2.2 Installer must be recognized as a Member in Good Standing with the Firestop Contractors International Association (FCIA). Submit written proof of current membership.
  - 1.8.2.3 Qualifications: Firestopping installer must trained and certified by firestopping manufacturer.
  - 1.8.2.4 Training: Ensure workers, including the site supervisor, have completed one of the following:
    - .1 Manufacturer training on the products/systems installed as part of this Section.
    - .2 Training under the FCIA Firestop Containment Worker Education Program.
- 1.8.3 Single Source Responsibility: Obtain primary materials for this Section from a single source by a single manufacturer, and secondary materials from sources recommended by manufacturers of primary materials.
  - 1.8.3.1 Alternative Systems: When no specific tested listed firestop system is available from the manufacturer for a particular firestop configuration,

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review systems from other manufacturers to identify a suitable listed firestop system.

- 1.8.4 First Installation Review: Construct sample installations to verify selections made under submittals, demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

1.8.4.1 Location: In-situ (i.e. first installation), as directed on site by Consultant.

1.8.4.2 Purpose: To set benchmarks for installation and to judge subsequent work. Maintain such sample installations during construction in undisturbed condition.

1.8.4.3 Reviewed Sample Installations: May become part of the completed work if undisturbed at the time of Substantial Performance of The work, provided they comply with requirements outlined in Contract Documents.

## **1.9 DELIVERY, STORAGE AND HANDLING**

1.9.1 Product Requirements, generally: in accordance with Section 01 61 00, Common Product Requirements.

1.9.2 Deliver, store and handle firestopping and smoke seals materials in accordance with manufacturer's written instructions. Deliver materials to site in original factory packaging, labelled with manufacturer's name and address. Store materials in off-ground, in clean, dry, well-ventilated area. Replace defective or damaged materials with new.

1.9.3 Deliver products in original, unopened containers or packages.

1.9.4 Ensure labels are intact and legible, identifying the product, manufacturer, date of manufacture, lot number, shelf life (if applicable), testing and inspecting agency's classification marking, curing time, and mixing instructions for multi-component materials.

1.9.5 Store and handle materials to prevent deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.9.6 Coordinate delivery with scheduled installation dates to minimize storage time on site.

## **1.10 FIELD CONDITIONS**

1.10.1 Environmental Limitations: Do not install through-penetration firestop systems when ambient or substrate temperatures are outside limits permitted by through-penetration firestop system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.

1.10.2 Install and cure Firestopping and smoke seals per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

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## **1.11 WARRANTY**

- 1.11.1 Extended warranty: Submit for Owner's review and acceptance, manufacturer's extended warranty in which manufacturer commits to repair or replace components of firestopping and smoke seals that fail within specified warranty period. Manufacturer's extended warranty is in addition to, and does not supersede, any other rights that Owner may have under Contract Documents.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURERS**

- 2.1.1 Provided requirements of Contract Documents are satisfied, the following manufacturers may supply Products for work this Section:
- 2.1.1.1 3M Fire Protection Products.
  - 2.1.1.2 Hilti (Canada) Limited.
  - 2.1.1.3 International Fireproof Technology Inc.
  - 2.1.1.4 Specified Technologies Inc.
  - 2.1.1.5 Tremco, Inc.
- 2.1.2 Basis-of-Design: This specification is based on Products and Systems by Hilti (Canada) Corporation. Comparable Products from manufacturers listed herein, offering functionally, aesthetically equivalent products in Consultant's opinion and subject to Consultant's review will be considered provided they meet the requirements of this Specification

### **2.2 REGULATORY REQUIREMENTS**

- 2.2.1 Ensure tests for firestopping and smoke seals are conducted by a qualified testing agency acceptable to authorities having jurisdiction.
- 2.2.1.1 Products must bear classification markings from a qualified testing and inspecting agency.
  - 2.2.1.2 Classification markings on firestopping and smoke seals must correspond to designations listed by:
    - .1 ULC and UL in the "Fire Resistance Directory."
    - .2 Intertek ETL SEMKO in its "Directory of Listed Building Products."
    - .3 ULC Guide No. 40 U19.
- 2.2.2 Systems selection, analysis, installation, and inspection of firestop systems must be in accordance with recommended practices as indicated in FCIA Firestop Manual of Practice (MOP).

### **2.3 PERFORMANCE / DESIGN CRITERIA**

- 2.3.1 Provide firestopping and smoke seals designed to resist fire spread, smoke, and gas passage, as specified in Contract Documents and in accordance with OBC 3.1.9.

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- 2.3.1.1 Firestop system selected shall have been tested at an elevated differential pressure of 50Pa where such pressure is required by the Ontario Building Code.
- 2.3.2 Compatibility: Firestopping and smoke seals must be compatible with each other, the substrates forming openings, and any penetrating items.
  - 2.3.2.1 Verify compatibility of firestop system components with abutting dissimilar membranes, architectural coatings, and finishes at floors, walls, and ceilings.
  - 2.3.2.2 Plastic Pipe and Coated Wire Compatibility: Firestop materials in direct contact with plastic pipe or plastic-coated wire must undergo compatibility testing by the systems manufacturer or pipe and wire manufacturer.
  - 2.3.2.3 CPVC Piping: All firestop systems in contact with CPVC piping (direct or indirect) must be FBC system compatible, including spray-applied firestop materials that may overspray onto CPVC pipe.
- 2.3.3 Material Reactions: Ensure materials and products provided do not cause stress, chemical or physical reactions, or other damage to penetrating items or adjacent materials.
  - 2.3.3.1 Ensure firestop systems exposed to ambient conditions do not deteriorate after curing, during construction and after completion.
- 2.3.4 Acoustics: Ensure firestopping systems do not affect the acoustical performance of acoustical assemblies.
- 2.3.5 Architectural considerations: when exposed to view, firestop system to consider architectural finish, potential traffic, physical damage and exposure to moisture and heat.
- 2.3.6 Exposed Firestopping and smoke seals: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined by CAN/ULC-S102.
- 2.3.7 Environmental considerations: Select materials considering the environment during and after curing, and the intended use of space. Confirm compatibility with the following:
  - 2.3.7.1 Spaces requiring resistance to infection and biological spread through assemblies.
  - 2.3.7.2 Spaces containing sensitive electronic equipment.
  - 2.3.7.3 Preventing contamination of laboratory and manufacturing environments.
- 2.3.8 Gypsum Products: The use of gypsum products for firestopping is strictly prohibited.
- 2.3.9 Penetrations in Fire Separations: Provide fire stopping and smoke seals with "F" ratings determined per CAN/ULC-S115.
  - 2.3.9.1 Rating: Minimum 1 hour, but not less than the fire-rating of elements penetrated.

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- 2.3.10 Penetrations in Firewalls or Horizontal Assemblies: Provide firestopping and smoke seals with “FT” ratings determined per CAN/ULC-S115
  - 2.3.10.1 Rating: Minimum 1 hour, but not less than the fire-rating of elements penetrated.
- 2.3.11 Penetrations in Smoke Barriers: Provide firestopping and smoke seals with “L” ratings determined per CAN/ULC-S115
  - 2.3.11.1 Rating: Not exceeding 25 L/s per sq. m (5.0 cfm/sq. ft.) of penetration opening at 75 Pa (0.30-inch wg) at both ambient and elevated temperatures.
- 2.3.12 Penetrations in Wet Locations: Provide firestopping and smoke seals with “W” ratings showing no evidence of water leakage when tested according to UL 1479.
  - 2.3.12.1 Rating: Minimum Class 1.
  - 2.3.12.2 Water-based products are not acceptable in wet areas.
- 2.3.13 Low-Emitting Materials: Firestopping and smoke seals sealants and sealant primers shall comply 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."
- 2.3.14 Microbial and Fungal Resistance: Provide firestopping capable of achieving a Class 1 rating when tested in accordance with ASTM G21 for antibacterial and antifungal properties to inhibit growth of bacteria, mould, mildew and fungi.

## **2.4 MATERIALS**

- 2.4.1 Final selection of firestopping systems and products is responsibility of Contractor.
- 2.4.2 Provide asbestos-free materials and systems capable of maintaining effective barrier against the passage of flame, smoke and water and the transmission of heat in compliance with requirements of CAN-ULC-S115 and not to exceed opening sizes for which they are intended, as indicated on System Design Listing.
- 2.4.3 Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer plastic sleeve lined with an intumescent strip, a radial or square extended flange attached to one end of the sleeve for fastening to concrete formwork.
  - 2.4.3.1 Basis-of-Design: “CFS-CID U and CFS-CID MD P/M” as suitable for penetrant type by Hilti (Canada) Limited or approved equivalent.
- 2.4.4 Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.
  - 2.4.4.1 Basis-of-Design: “CFS-DID Series” as suitable for penetrant type by Hilti (Canada) Limited or approved equivalent.
- 2.4.5 Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced or stainless-steel elastomeric sheet bonded to galvanized-steel sheet.

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- 2.4.5.1 Basis-of-Design: "CFS-COS Series" as suitable for application by Hilti (Canada) Limited or approved equivalent
- 2.4.6 Intumescent Putties: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.
  - 2.4.6.1 Basis-of-Design: "CP618/CP617" as suitable for application by Hilti (Canada) Limited or approved equivalent.
- 2.4.7 Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.
  - 2.4.7.1 Basis-of-Design: "CP648-S" as suitable for application by Hilti (Canada) Limited or approved equivalent.
- 2.4.8 Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.
  - 2.4.8.1 Basis-of-Design: "CP 637 Firestop Mortar" as suitable for application by Hilti (Canada) Limited or approved equivalent.
- 2.4.9 Firestop Block: Ready-to-use, Non-curing, reusable solution intumescent flexible block designed to seal medium to large size openings.
  - 2.4.9.1 Basis-of-Design: "Firestop Block (CFS-BL)" as suitable for application by Hilti (Canada) Limited or approved equivalent.
- 2.4.10 Firestop Foams: Multicomponent, silicone-based or polyurethane-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.
  - 2.4.10.1 Basis-of-Design: "Firestop Foam CP 620 and CP 660" as suitable for application by Hilti (Canada) Limited or approved equivalent.
- 2.4.11 Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade that tested for water rated firestop systems indicated below:
  - 2.4.11.1 Grade for Horizontal Surfaces: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces.
  - 2.4.11.2 Grade for Vertical Surfaces: Nonsag formulation for openings in vertical and other surfaces.
  - 2.4.11.3 Basis-of-Design: "CFS-S GG/SL Series" as suitable for application by Hilti (Canada) Limited or approved equivalent.
- 2.4.12 Firestop Joint Spray: Sprayable fire rated mastic for construction joint; maximum flexibility in accordance with ASTM E1966 and UL 2079; containing no halogens, solvents or asbestos; water based, paintable.
  - 2.4.12.1 Basis-of-Design: "CFS-SP WB" as suitable for application by Hilti (Canada) Limited or approved equivalent.
- 2.4.13 Firestop Top Track: Top runner manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance-rated assembly indicated on Drawings and in width to accommodate depth of studs. Coordinate with Section 09 21 16.
  - 2.4.13.1 Fire-rated applications: "Firestop Top Track Seal (CFS-TTS)" by Hilti (Canada) Limited.

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- 2.4.13.2 Non-fire-rated applications (smoke-rated only): "Smoke and Acoustic Track Seal (CS-TTS SA)" by Hilti (Canada) Limited
- 2.4.14 Firestop Bottom Track: Pre-formed firestop, smoke and sound seal for the bottom-of-the-wall joints between bottom track and drywall
  - 2.4.14.1 Fire-rated and Non-fire-rated applications: "Firestop Bottom Track Seal (CFS-BTS)" by Hilti (Canada) Limited.
- 2.4.15 Modular Firestop Sleeve: Factory-assembled devices lined with an intumescent strip for single and cable bundles firestopping. Re-penetrable and works for new and existing cable penetrations in floor and wall applications.
  - 2.4.15.1 Basis-of-Design: Modular Firestop Sleeve "CFS-MSL" by Hilti (Canada) Limited or approved equivalent.
- 2.4.16 Circular Firestop Sleeve: Factory-assembled devices lined with an intumescent strip for single and cable bundles firestopping. Re-penetrable and works for new and existing cable penetrations in floor and wall applications.
  - 2.4.16.1 Basis-of-Design: Firestop Sleeve "CP 653 BA and CFS-SL RK" by Hilti (Canada) Limited or approved equivalent.
- 2.4.17 Intumescent Sealants: Intumescent firestop sealant that helps protect combustible and non-combustible penetrations. Paintable and tested for water rated firestop systems.
  - 2.4.17.1 Basis-of-Design: "Firestop Sealant FS ONE MAX" as suitable for application by Hilti (Canada) Limited or approved equivalent.
- 2.4.18 Acrylic Sealant: Paintable acrylic based firestop sealant that provides movement capability in fire rated joints and seals through-penetrations applications.
  - 2.4.18.1 Basis-of-Design: "Firestop Sealant CP 606" as suitable for application by Hilti (Canada) Limited or approved equivalent.
- 2.4.19 Firestop Building Perimeter (Spray): Sprayable low slump fire rated silicone for building perimeter in accordance with ASTM D 6904, ASTM E 2037 and CAN/ULC – S115; containing no halogens, solvents or asbestos.
  - 2.4.19.1 Basis-of-Design: "CFS-SP SIL" as suitable for application by Hilti (Canada) Limited or approved equivalent.
- 2.4.20 Preformed Mineral Wool: Pre-formed mineral wool designed to fit flutes of metal profile deck; as a backer for spray material.
  - 2.4.20.1 Basis-of-Design: "Hilti Speed Plugs (CP 777) Hilti Speed Strips (CP 767)" as suitable for application by Hilti (Canada) Limited or approved equivalent.
- 2.4.21 Firestop Collars: Prefabricated firestop collar with a galvanized steel housing and intumescent inserts for firestopping combustible plastic pipes
  - 2.4.21.1 Basis-of-Design: "Hilti Firestop Collar (CP 643N)" as suitable for application by Hilti (Canada) Limited or approved equivalent.
- 2.4.22 Non-fire Rated Sealant: Paintable acrylic smoke and acoustic non-fire rated sealant for drywall joints and pipe penetrations

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- 2.4.22.1 Basis-of-Design: "CS-S SA LIGHT Smoke and Acoustic sealant" as suitable for application by Hilti (Canada) Limited or approved equivalent.
- 2.4.23 Non-fire Rated Spray: Paintable acrylic smoke and acoustic non-fire rated spray for drywall joints
  - 2.4.23.1 Basis-of-Design: "CP-572 Smoke and Acoustic sealant" as suitable for application by Hilti (Canada) Limited or approved equivalent.
- 2.4.24 Primers: As required by firestopping manufacturer and compatible with selected system and contiguous materials.
- 2.4.25 Water: Potable
- 2.4.26 Pipe and duct insulation and wrappings: compatible with firestopping systems.
- 2.4.27 Intumescent pads: Permanently pliable type.
- 2.4.28 Intumescent composite sheet: Composite sheet, strip or precut shapes.
- 2.4.29 Re-penetrable Sealants: Non curing, re-penetrable intumescent sealants, caulking or putty materials for use with flexible cable or cable bundles.

## **2.5 MIXING**

- 2.5.1 Comply with firestopping and smoke seals manufacturer's written instructions for mixing requirements including, but not limited to:
  - 2.5.1.1 Proportioning materials and water accurately (if required)
  - 2.5.1.2 Using the specified type of mixing equipment
  - 2.5.1.3 Selecting the correct mixer speeds
  - 2.5.1.4 Using appropriate mixing containers
  - 2.5.1.5 Adhering to specified mixing times
  - 2.5.1.6 Additional procedures as needed to ensure uniform quality and optimum performance as indicated.

## **2.6 ACCESSORIES**

- 2.6.1 Provide necessary components for each firestopping and smoke seals system to install fill materials and maintain required ratings. Use only components specified by the manufacturer and approved by a qualified testing and inspecting agency.
- 2.6.2 Provide additional components needed to install fill materials and maintain required ratings. Use only components specified by the penetration firestopping manufacturer and approved by a qualified testing and inspecting agency. Accessories include, but are not limited to:
  - 2.6.2.1 Slag-wool-fiber or rock-wool-fiber insulation.
  - 2.6.2.2 Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
  - 2.6.2.3 Fire-rated form board.
  - 2.6.2.4 Fillers for sealants.
  - 2.6.2.5 Temporary forming materials.



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- 2.6.2.6 Substrate primers.
- 2.6.2.7 Collars.
- 2.6.2.8 Steel sleeves.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- 3.1.1 Verify actual site conditions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.
- 3.1.2 Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.
- 3.1.3 Examine substrates, openings, voids, adjoining construction and conditions under which firestop is to be installed. Confirm compatibility of surfaces. Verify penetrating items are securely fixed and properly located with proper space allowance between penetrations and surfaces of openings.
- 3.1.4 Confirm locations of exposed/non-exposed firestopping/smoke seal surfaces prior to application. Provide movement capability at movement joints in accordance with design requirements for movement joint.

### **3.2 PREPARATION**

- 3.2.1 Surface Cleaning: Clean out openings immediately before installing Firestopping and smoke seals to comply with manufacturer's written instructions and with the following requirements:
  - 3.2.1.1 Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of Firestopping and smoke seals.
  - 3.2.1.2 Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with Firestopping and smoke seals. Remove loose particles remaining from cleaning operation.
  - 3.2.1.3 Remove laitance and form-release agents from concrete.
- 3.2.2 Priming: Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- 3.2.3 Masking Tape: Use masking tape to prevent Firestopping and smoke seals from contacting adjoining surfaces that will remain exposed on completion of the Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove stains. Remove tape as soon as possible without disturbing firestopping's seal with substrates.

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### **3.3 INSTALLATION**

- 3.3.1 Installation, generally: Install work of this Section in strict accordance with manufacturer's written installation instructions and reviewed Shop Drawings. Supplement manufacturer's installation instructions with additional installation requirements specified in this Section to produce specified work results.
- 3.3.2 Comply with ULC, and cUL, listings and manufacturer's instructions for type of material and condition of opening in each case. Consult with manufacturer to determine proper procedure for conditions not fully covered by printed instructions. Record in writing any oral instructions received, with copy to manufacturer.
- 3.3.3 Provide firestopping to all penetrations passing through fire resistance rated wall and floor assemblies and other locations as indicated on Drawings.
- 3.3.4 Remove excess firestopping material promptly as work progresses and upon completion. Provide leak-proof dams as required to seal openings and contain firestop until cured. Install damming in accordance with test design and manufacturer's instructions.

### **3.4 IDENTIFICATION**

- 3.4.1 Identify Firestopping and smoke seals with pressure-sensitive, self-adhesive, preprinted plastic labels. Attach labels permanently to surfaces adjacent to and within 150 mm (6 inches) of firestopping edge so labels will be visible to anyone seeking to remove penetrating items or firestopping. Include the following information on labels:
  - 3.4.1.1 The words "Warning - Firestopping and smoke seals - Do Not Disturb. Notify Building Management of Any Damage."
  - 3.4.1.2 Contractor's name, address, and phone number.
  - 3.4.1.3 Designation of applicable testing and inspecting agency.
  - 3.4.1.4 Date of installation.
  - 3.4.1.5 Manufacturer's name.
  - 3.4.1.6 Installer's name.
- 3.4.2 Identification labels and markings to be indelible for the expected service life of the installation.
- 3.4.3 Provide identification labels at each penetration.

### **3.5 FIELD QUALITY CONTROL**

- 3.5.1 Manufacturer's services: A manufacturer's direct representative (not distributor or agent) must be on-site during initial installation of firestop systems to train appropriate contractor personnel in proper selection and installation procedures in accordance with manufacturer's written recommendations published in literature and drawing details.

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### 3.6 PROTECTION

- 3.6.1 Protect firestopping and smoke seals from damage, soiling and contaminating substances resulting from construction activities or caused by work of other trades.
- 3.6.2 Where soiling or spills have occurred, remove spills and soiling from adjacent surfaces using cleaning procedures recommended in writing by affected material's manufacturer. Do not use materials or process that can damage finishes, surfaces, or construction.
- 3.6.3 Promptly replace firestopping and smoke seals work damaged during construction that cannot be satisfactorily repaired.

### 3.7 CLEANING AND WASTE MANAGEMENT

- 3.7.1 Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by Firestopping and smoke seals manufacturers and that do not damage materials in which openings occur.
- 3.7.2 Cleaning: Maintain clean construction area at the end of each day. When activities of this Section are complete, remove materials, tools, equipment and rubbish.
- 3.7.3 Waste Management and Disposal: sort waste for reuse, recycling, or disposal, as specified. Remove recycling bins and containers from site and dispose of contents at the appropriate waste disposal facilities.

### 3.8 FIRESTOPPING AND SMOKE SEALS SCHEDULE

- 3.8.1 Require firestopping locations: In accordance with OBC 3.1.9
- 3.8.2 Submit final firestop systems based on reference system numbers in the ULC Fire Resistance Directory or Online Certification Directory. Note: Provided systems below are for basis-of-design only.

#### **Schedule of through penetration firestop systems. Basis of design: Hilti, Canada**

CONCRETE FLOORS			CONCRETE OR BLOCK WALLS		
TYPE OF PENETRANT	F-RATING (HR)	BASIS OF DESIGN cUL SYSTEM	TYPE OF PENETRANT	F-RATING (HR)	BASIS OF DESIGN cUL SYSTEM
BLANK OPENINGS	1	F-A-0006, C-AJ-0055, C-AJ- 0070, C-A-J-0138	BLANK OPENINGS	1	C-AJ-0055, C-AJ-0070
	2	F-A-0006, C-AJ-0055, C-AJ-0070, C-A-J-0138		2	C-AJ-0055, C-AJ-0070
	3	F-A-0006, C-AJ-0055, C-AJ-0086,		3	C-AJ-0055, C-AJ-0086
SINGLE METAL PIPES OR CONDUIT	1	C-AJ-1226, F-A-1028, F-A-1017	SINGLE METAL PIPES OR CONDUIT	1	C-AJ-1226, W-J-1067, W-J-1020
	2	C-AJ-1226, F-A-1028, F-A-1017		2	C-AJ-1226, W-J-1067, W-J-1020, W-J-1248
	3	C-AJ-1226, F-A-1017		3	C-AJ-1226, W-J-1041, W-J-1068
	4	C-BJ -1037, C-BJ-1034, F-A-1091		4	C-BJ-1034, C-BJ-1037, W-J-1041, W-J-1042, W-J-1068
SINGLE NON-METALLIC PIPE OR CONDUIT (I.E. PVC, CPVC,	1	F-A-2240, F-A-2025, CA-J-2078 , C-AJ-2035, CA-J-2022	SINGLE NON-METALLIC PIPE OR CONDUIT (I.E. PVC, CPVC, ABS, FRP, ENT)	1	C-AJ-2109C-AJ-2078, W-J-2332, C-AJ-2024, C-AJ-2035, C-AJ-2022
	2	C-AJ-2035, C-AJ-2022, C-AJ-2021		2	C-AJ-2078, W-J-2332, C-AJ-2024, C-AJ-2035, C-AJ-2022

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CONCRETE FLOORS			CONCRETE OR BLOCK WALLS		
TYPE OF PENETRANT	F-RATING (HR)	BASIS OF DESIGN cUL SYSTEM	TYPE OF PENETRANT	F-RATING (HR)	BASIS OF DESIGN cUL SYSTEM
ABS, FRP, ENT)	3	C-A-J-2012, C-AJ-2035-F-A-2012		3	CA-J-2035 C-J-2035 C-AJ-2024
	4			4	
SINGLE/CABLE BUNDLES	1	F-A-3007,C-AJ-3095,C-AJ-3180, C-AJ-3283	SINGLE/CABLE BUNDLES	1	W-J-3036, C-AJ-3095, C-AJ-3180, W-J-3060, W-J-3167
	2	F-A-3007,C-AJ-3095,C-AJ-3334, F-A-3060		2	W-J-3036, C-AJ-3095, C-AJ-3180, W-J-3060, W-J-3167, W-J-3189
	3	F-A-3007, C-AJ 3095, C-AJ-3285		3	C-AJ-3095, C-AJ-3180, W-J-3167
				4	W-J-3050
CABLE TRAY	1	C-AJ-4034, C-AJ-4071	CABLE TRAY	1	W-J-4027, C-AJ-4034, C-AJ-4071
	2	C-AJ-4034, C-AJ-4071		2	W-J-4027, C-AJ-4034, C-AJ-4071
	3	C-AJ-4034, C-AJ-4035		3	C-AJ-4034, C-AJ-4035
				4	W-J-8007
SINGLE INSULATED PIPES	1	F-A 5015, F-A 5017, C-AJ-5090, C-AJ-5091, C-AJ-5048	SINGLE INSULATED PIPES	1	C-AJ-5090, C-AJ-5091, C-AJ-5061, W-J-5042
	2	F-A 5015, F-A 5017, C-AJ-5090, C-AJ-5090		2	C-AJ-5090, C-AJ-5091, C-AJ-5061, W-J-5042
	3	F-A 5016, C-AJ-5090, F-A-5018		3	C-AJ-5090, C-AJ-5061
	4	C-BJ-5006		4	C-BJ-5006, W-J-5028
ELECTRICAL BUSWAY	1	C-AJ-6006, C-AJ-6017, F-A-6002, C-AJ-6036	ELECTRICAL BUSWAY	1	C-AJ-6006, C-AJ-6017, C-AJ-6036
	2	C-AJ-6006, C-AJ-6017, F-A 6042, C-AJ-6036		2	C-AJ-6006, C-AJ-6017, C-AJ-6036
	3	C-AJ-6006, C-AJ-6017		3	C-AJ-6006, C-AJ-6017
MECHANICAL DUCTWORK WITHOUT DAMPERS NON-INSULATED	1	C-AJ-7046, C-AJ-7051, C-AJ-7084	MECHANICAL DUCTWORK WITHOUT DAMPERS NON-INSULATED	1	C-AJ-7046, C-AJ-7051, W-J-7021, W-J-7022
	2	C-AJ-7046, C-AJ-7051, C-AJ-7084		2	C-AJ-7046, C-AJ-7051, W-J-7021, W-J-7022
	3	C-AJ-7046, C-AJ-7051		3	C-AJ-7046, C-AJ-7051
MECHANICAL DUCTWORK WITHOUT DAMPERS INSULATED	2	C-A-J-7145	MECHANICAL DUCTWORK WITHOUT DAMPERS INSULATED	1	W-J-7029, W-J-7124
				2	W-J-7091, W-J-7112, W-J-7124
MIXED PENETRANTS	1	C-AJ 8099, C-AJ-8056, C-AJ-8143	MIXED PENETRANTS	1	C-AJ 8099, C-AJ 8056, W-J 8007, C-AJ 8143
	2	C-AJ-8099, C-AJ-8056, C-AJ-8143		2	C-AJ 8099, C-AJ 8056, W-J 8007, C-AJ 8143
	3	C-AJ-8099, C-AJ-8056		3	C-AJ 8041, C-AJ 8056, W-J 8007, C-AJ 8099
	4	C-AJ-8095		4	C-AJ 8095, W-J 8007

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**Schedule of joint firestop systems. Basis of design: Hilti Canada**

Joint Type	F-Rating (Hr)	Hilti Basis of Design cUL System	
		Joint Width Less than or Equal to 2"	Joint Width Greater than 2" Less than or Equal to 6" <sup>4</sup>
Concrete (Floor to Floor)	1	FF-D-1012, FF-D-1013 <sup>1</sup>	FF-D-1012, FF-D-1013
	2	FF-D-1012, FF-D-1013 <sup>1</sup>	FF-D-1012, FF-D-1013
	3	FF-D-1011, FF-D-1026 <sup>1</sup>	FF-D-1011, FF-D-1026
	4	FF-D-1047	FF-D-1125
Concrete (Edge of Floor Slab to Wall)	1	FW-D-1011, FW-D-1012, FW-D-1013	FW-D-1011, FW-D-1012, FW-D-1013, FW-D-1021
	2	FW-D-1011, FW-D-1012, FW-D-1013	FW-D-1011, FW-D-1012, FW-D-1013, FW-D-1021
	3	FW-D-1011	FW-D-1011, FW-D-1021
	4	FW-D-1047	FW-D-1092
Concrete or Block Wall to Flat Concrete Floor (Top-of-Wall)	1	N/A**	N/A**
	2	HW-D-0097 <sup>1</sup>	HW-D-1009, HW-D-1045
	3	HW-D-1008 <sup>1</sup> , HW-D 0268	HW-D-1008
	4	HW-D-1042	HW-D-1103
Concrete or Block Wall to Concrete Over Fluted Metal Deck (Top-of-Wall)	1	HW-D-0098	N/A**
	2	HW-D-0080, HW-D-0081, HW-D-0098	HW-D-1037
	3	N/A**	N/A**
	4	HW-D-0294	N/A**
Gypsum Wall to Flat Concrete Floor (Top-of-Wall)	1	HW-D-0757, HW-D-0082, HW-D-0083, HW-D-0106, HW-D-0119	HW-D-1011, HW-D-1012, HW-1020
	2	HW-D-0757, HW-D-0082, HW-D-0083, HW-D-0106, HW-D-0119	HW-D-1011, HW-D-1012, HW-1020
	3	HW-D-0119	HW-D-1011
Gypsum Shaft Wall to Floor (Top-of-Wall)	2	HW-D-0342 (FLAT CONCRETE) HW-D-0541, HW-D-0542 (CONCRETE OVER METAL DECK)	N/A**
Gypsum Shaft Wall to Concrete Floor (Bottom-of- Wall)	1	BW-S-0023	N/A**
	2	BW-S-0023	N/A**
Gypsum Wall to Concrete Floor (Bottom-of-Wall)	1	BW-S-0001, BW-S-0002	N/A**
	2	BW-S-0001, BW-S-0002,	N/A**
Gypsum Wall to Concrete Over Fluted Metal Deck (Top- of-Wall)	1	HW-D-0042*, HW-D-0049*, HW-D-0087*, HW-D-0089*, HW-D-0045, HW-D-0046*, HW-D-0076*, HW-D-0077*, HW-D-0154, HW-D-0184*, HW-D-0292, HW-D-0295, HW-D-538*	HWD-1011, HWD-1012, HW- 1020
	2	HW-D-0042*, HW-D-0049*, HW-D-0087*, HW-D-0089*, HW-D-0045, HW-D-0046*, HW-D-0076*, HW-D-0077*, HW-D-0154, HW-D-0184*, HW-D-292, HW-D-0295, HW- D0538*	HW-D-1011, HW-D-1012, HW-D-1020
	3	HW-D-0292, HW-D-0295	HWD-1011, HWD-1012, HW- 1020
	4	HW-D-0292, HW-D-0295	N/A**

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Joint Type	F-Rating (Hr)	Hilti Basis of Design cUL System	
		Joint Width Less than or Equal to 2"	Joint Width Greater than 2" Less than or Equal to 6" <sup>4</sup>
Concrete (Wall to Wall)	2	WW-D-0017, WW-D-0082	WW-D-1080, WW-D-1084
	3	WW-D-1011 <sup>1</sup> , WW-D-0032	WW-D-1011
	4	WW-D-1047	WW-D-1128
Gypsum to Concrete (Wall to Wall)	1	WW-D-0068	N/A**
	2	WW-D-0068	N/A**

\* SEE NOTE 3 \*\* CONTACT HILTI FOR CURRENT cUL-CLASSIFIED SYSTEM OR ENGINEERING JUDGMENT DRAWING: 1-800-363-4458

**NOTES:**

1. CLASSIFIED SYSTEMS FOR 2" - 6" WIDE JOINTS MAY BE USED FOR JOINTS 2" WIDE AND LESS.
2. CONFIRM THAT MOVEMENT CAPABILITIES OF THE SELECTED cUL SYSTEM MEETS OR EXCEEDS THE SPECIFIED MOVEMENT RANGE OF THE PARTICULAR JOINT.
3. SYSTEMS MARKED WITH ASTERIK (\*) ARE SUITABLE FOR TOP-OF-WALL JOINTS WHERE THE FLUTED METAL DECK HAS SPRAY-ON MONOKOTE MK-6/HY FIREPROOFING.
4. VERIFY ALLOWABLE JOINT WIDTH ON SPECIFIC UL SYSTEM DRAWING.

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**ISSUED FOR:** TENDER

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**END OF SECTION**

## **PART 1      GENERAL**

### **1.1      GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.
- 1.1.2 Contractor is solely responsible for dividing the Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of the Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2      SUMMARY**

- 1.2.1 Provide labour, materials, Products, equipment and services to complete the joint sealants work specified herein. This includes, but is not necessarily limited, to:
  - 1.2.1.1 Interior Joints in Vertical and Horizontal Nontraffic Surfaces
    - .1 Control and expansion joints on exposed interior surfaces of exterior walls.
    - .2 Perimeter joints of exterior openings where indicated on Drawings.
    - .3 Perimeter joints between interior wall surfaces and frames of interior doors, windows, and elevator entrances.
    - .4 Joints between plumbing fixtures and adjoining walls, floors, and counters.
    - .5 Other joints as indicated on Drawings.
  - 1.2.1.2 Interior Joints in Horizontal Traffic Surfaces
    - .1 Control and expansion joints in cast-in-place concrete slabs.
    - .2 Other joints as indicated on Drawings.
  - 1.2.1.3 Auxiliary materials required for a complete installation.
- 1.2.2 Related Requirements: Specifications throughout all Divisions of the Project shall be read as a whole, and may be directly applicable to this Section. Related requirements provided below are for convenience purposes only:
  - 1.2.2.1 Section 07 84 10 – Firestopping and Smoke Seals.
  - 1.2.2.2 Section 09 21 16 - Gypsum Board for sealing perimeter joints.

### **1.3      REFERENCES**

- 1.3.1 Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply.



## **1.4 ADMINISTRATIVE REQUIREMENTS**

- 1.4.1 Pre-installation Meetings: Schedule and hold a pre-installation meeting at the Project site before beginning work on this Section to coordinate activities with related Subcontractors.
  - 1.4.1.1 Notification: Where Consultant attendance is required; minimum 72 hour notice is required.
  - 1.4.1.2 Agenda: Review foreseeable methods and procedures related to sealing substrates, including but not limited to, the following:
    - .1 Discuss substrates to be sealed, discuss as fabricated and installed condition of substrate, sealant application, flashing details, and other preparatory work.
    - .2 Review joint sealant requirements: drawings, specifications, and other contract documents.
    - .3 Review required submittals, both complete and incomplete
    - .4 Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions.
  - 1.4.1.3 Reporting: Record significant discussions, agreements, and disagreements, including required corrective measures and actions.
  - 1.4.1.4 Distribution: Distribute minutes of the meeting to each party present and to other parties requiring information not more than 72 hours after meeting.

## **1.5 SUBMITTALS**

- 1.5.1 Submittals, generally: in accordance with Section 01 33 00, Submittal Procedures.
- 1.5.2 Product Data: Submit manufacturer's product characteristics, catalogue cuts, installation instructions and other relevant information for each material and product used for joint sealants work specified in this Section.
  - 1.5.2.1 Submit complete instructions for handling, storage, mixing, priming, installation, curing and protection of each type of sealant.
- 1.5.3 Test Results:
  - 1.5.3.1 Preconstruction Compatibility and Adhesion Test Reports: Submit reports from the sealant manufacturer indicating materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
  - 1.5.3.2 Field-Adhesion Test Reports: Submit laboratory and field test results confirming compatibility and/or adhesion for specific materials proposed for application.
- 1.5.4 Manufacturer's letter: Submit letter clearly indicating proposed lot numbers of each sealant to be supplied and their expiration date sequence.
- 1.5.5 Joint-Sealant Schedule: Include the following information:
  - 1.5.5.1 Joint-sealant application, joint location, and designation.
  - 1.5.5.2 Joint-sealant manufacturer and product name.

- 1.5.5.3 Joint-sealant formulation.
- 1.5.5.4 Joint-sealant colour.
- 1.5.6 Environmental and Material Transparency:
  - 1.5.6.1 Embodied Carbon / EPDs: When available, Submit EPDs conforming to ISO 14025 or equivalent standard; prioritize products with such documentation when choices are at Contractor's option.
  - 1.5.6.2 Material Ingredient Disclosure: When available, submit documentation identifying chemical inventories of materials to at least 0.1% (1000ppm) in accordance with HPD Open Standard, Cradle to Cradle (Basic v2/Bronze v3), ILFI Declare, or equivalent standard; products with such documentation when choices are at Contractor's option.
- 1.5.7 Samples:
  - 1.5.7.1 Submit selection and verification samples for joint sealants requiring colour, texture, or design selection.
  - 1.5.7.2 Provide the manufacturer's list of finishes or colour swatches for the Consultant's selection.
  - 1.5.7.3 As a minimum, submit samples of each type and colour of exposed joint sealant required. Provide fully cured joint sealant samples in 19 mm (3/4 in) wide joints formed between two 300 mm (12 in) long strips of materials to be sealed.
- 1.5.8 Warranties: Submit warranties in accordance with Division 01 for special warranties specified in this section..

## **1.6 CLOSEOUT SUBMITTALS**

- 1.6.1 Operating and Maintenance Data: Submit care and maintenance instructions for joint sealants to be included in building operation and maintenance manual.
- 1.6.2 Warranty Documentation: Submit copy of extended warranties specified in this Section.

## **1.7 QUALITY ASSURANCE**

- 1.7.1 Manufacturer Qualifications: Provide Products for work of this Section by manufacturer with at least 10 years' experience manufacturing such materials.
- 1.7.2 Installer Qualifications: Engage an entity with sufficient experience installing, erecting, or assembling work similar in material, design, and extent to that shown on Drawings and Schedules, and whose work has resulted in construction with a track record of successful in-service performance.
- 1.7.3 Single Source Responsibility: Obtain primary materials for this Section from a single source by a single manufacturer, and secondary materials from sources recommended by manufacturers of primary materials.
- 1.7.4 First Installation Review: Construct sample installations to verify selections made under submittals, demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
  - 1.7.4.1 Location: In-situ (i.e. first installation), as directed on site by Consultant.

1.7.4.2 Purpose: To set benchmarks for installation and to judge subsequent work. Maintain such sample installations during construction in undisturbed condition.

- .1 Preparation, priming, application, and curing, shall conform to manufacturer's recommendations and actual proposed methods.
- .2 Schedule the applications, with allowance for sufficient curing time, so that samples may be examined and any necessary adjustments made.

1.7.4.3 Reviewed Sample Installations: May become part of the completed work if undisturbed at the time of Substantial Performance of The work, provided they comply with requirements outlined in Contract Documents.

## **1.8 DELIVERY, STORAGE AND HANDLING**

1.8.1 Product Requirements, generally: in accordance with Section 01 61 00, Common Product Requirements.

1.8.2 Deliver, store and handle joint sealants materials in accordance with manufacturer's written instructions. Deliver materials to site in original factory packaging, labelled with manufacturer's name and address. Store materials in off-ground, in clean, dry, well-ventilated area. Replace defective or damaged materials with new.

## **1.9 FIELD CONDITIONS**

1.9.1 Do not proceed with installation of joint sealants under the following conditions:

- 1.9.1.1 When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 5 deg C (40 deg F).
- 1.9.1.2 When joint substrates are wet.
- 1.9.1.3 Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated on Drawings and Schedules.
- 1.9.1.4 Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

## **1.10 WARRANTY**

1.10.1 Extended warranty: Submit for Owner's review and acceptance, manufacturer's extended warranty in which manufacturer commits to repair or replace components of joint sealants that fail within specified warranty period. Manufacturer's extended warranty is in addition to, and does not supersede, any other rights that Owner may have under Contract Documents.

1.10.1.1 Warranty Period:

- .1 Unless noted otherwise: Not less than 5 years from date of Substantial Performance of The work.
- .2 For silicone sealants: Not less than 20 years from date of Substantial Performance of The work.

## **PART 2      PRODUCTS**

### **2.1      MANUFACTURERS**

2.1.1 Provided requirements of Contract Documents are satisfied, the following manufacturers may supply Products for work this Section:

- 2.1.1.1 Dow Chemical of Canada ULC
- 2.1.1.2 GE Silicones (Momentive Performance Materials)
- 2.1.1.3 Pecora Corporation
- 2.1.1.4 Sika Canada Inc.;
- 2.1.1.5 Tremco Incorporated

### **2.2      PERFORMANCE / DESIGN CRITERIA**

2.2.1 Compatibility: Provide joint sealants, backings, and related materials that are compatible with each other and with joint substrates under service and application conditions.

2.2.1.1 Compatibility must be demonstrated by the joint-sealant manufacturer through testing and field experience.

2.2.2 Joint Sealants: Comply with ASTM C920 for type, grade, class, and uses related to exposure and joint substrates.

2.2.3 Suitability for Immersion in Liquids: For sealants indicated for Use I (joints continuously immersed in liquids), provide products tested according to ASTM C1247.

2.2.3.1 Unless otherwise indicated, use deionized water for testing sealants.

2.2.4 Stain-Test-Response Characteristics: For sealants specified as non-staining to porous substrates, provide products tested according to ASTM C1248.

2.2.5 Suitability for Contact with Food: For sealants indicated for joints in repeated contact with food, provide products complying with 21 CFR 177.2600.

2.2.6 Colours of Exposed Joint Sealants: As selected by Consultant from manufacturer's full range.

2.2.7 Low-Emitting Materials: For applicable Products specified or used for activities of this Section (i.e., site-applied coatings, adhesives, and sealants), submit certifications from third-party organizations indicating compliance with following:

2.2.7.1 VOC Emissions: California Department of Public Health (CDPH) Standard Method v1.2–2017, using applicable exposure scenario.

2.2.7.2 VOC Content: SCAQMD Rule 1113 (for paints and coatings) and SCAQMD Rule 1168 (for adhesives and sealants).

### **2.3      INTERIOR JOINT SEALANTS**

2.3.1 Sealant Type: Single component, nonsag, neutral curing silicone or urethane sealant

2.3.1.1 Specification: ASTM C920, Type S or Type M, Grade NS, Class 50, Class 35 or Class 25 as required for applications and joint design, for Use NT

2.3.1.2 Location: Interior joints in vertical surfaces and horizontal nontraffic surfaces as follows:

- .1 Control and expansion joints on exposed interior surfaces of exterior walls.
- .2 Perimeter joints of exterior openings.
- .3 Perimeter joints between interior wall surfaces and frames of interior doors, windows, and elevator entrances.
- .4 Other joints as indicated on Drawings and Schedules.

2.3.1.3 Acceptable Product:

- .1 Dow Chemical of Canada ULC
  - .1 Dowsil 791
  - .2 Dowsil 795
  - .3 Dowsil CWS
- .2 Tremco Incorporated
  - .1 Spectrem 2
  - .2 Spectrem 3
  - .3 Dymonic
  - .4 Dymonic FC
- .3 GE Silicones (Momentive Performance Materials)
  - .1 SilPruf LM SCS2700
- .4 Pecora Corporation
  - .1 890NST
  - .2 890FTS
  - .3 864NST
  - .4 PCS
  - .5 DynaTrol I-XL
  - .6 DynaTrol II
- .5 Sika Canada Inc.
  - .1 SikaSil WS-295

2.3.2 Sealant Type: Mildew-Resistant, Single-Component, Nonsag, Silicone Joint Sealant

2.3.2.1 Specification: ASTM C920, Type S, Grade NS, Class 25, for Use NT

2.3.2.2 Location: Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces as follows:

- .1 Joints between plumbing fixtures and adjoining walls, floors, and counters.
- .2 Other joints as indicated on Drawings and Schedules.

2.3.2.3 Acceptable Products:

- .1 Pecora Corporation
  - .1 898 NST
- .2 Dow Chemical of Canada ULC
  - .1 Dowsil 786 Mildew Resistant
  - .2 Dowsil Tub/Ceramic/Tile

- .3 GE Silicones (Momentive Performance Materials)
      - .1 Sanitary SCS1700
    - .4 Tremco Incorporated
      - .1 Tremsil 200 Sanitary
    - .5 Sika Canada Inc.
      - .1 Sikasil GP/GP HT
    - .6 Pecora Corporation
      - .1 898 NST
  - 2.3.3 Sealant Type: Nonsag, paintable, nonstaining latex or butyl rubber sealant
    - 2.3.3.1 Specification: ASTM C834 or ASTM C1311
    - 2.3.3.2 Location: Interior acoustical joints in vertical surfaces and horizontal nontraffic surfaces as follows:
      - .1 Acoustical joints at the top and bottom of gypsum board partitions; at the top of masonry walls and through non-fire-rated penetrations in gypsum and masonry walls.
      - .2 Other joints as indicated on Drawings and Schedules.
    - 2.3.3.3 Acceptable Products:
      - .1 Pecora Corporation
        - .1 AC-20 FTR
        - .2 AIS-919
      - .2 CGC Inc.
        - .1 SHEETROCK Acoustical Sealant
      - .3 Owens-Corning Canada Inc.
        - .1 QuietZone Acoustic Sealant
      - .4 Tremco Ltd.
        - .1 Tremco Acoustical Sealant
      - .5 Serious Materials
        - .1 QuietSeal
        - .2 QuietSeal 350
      - .6 Hilti
        - .1 CP506 – Smoke and Acoustic Sealant
      - .7 GE Silicones (Momentive Performance Materials)
        - .1 RCS20
  - 2.3.4 Sealant Type: Acrylic latex or siliconized acrylic latex
    - 2.3.4.1 Specification: ASTM C834, Type OP, Grade NF
    - 2.3.4.2 Location: Interior non-acoustical joints in vertical surfaces and horizontal nontraffic surfaces as follows:
      - .1 Non-acoustical and non-moving joints between interior painted surfaces and adjacent materials.
    - 2.3.4.3 Acceptable Products:
      - .1 Pecora Corporation
        - .1 AC-20+

- .2 Tremco Incorporated
          - .1 Tremflex 834
- 2.3.5 Sealant Type: Single-Component or Multicomponent, Traffic-Grade, Silicone or Urethane Joint Sealant
  - 2.3.5.1 Specification: ASTM C920, Type S or Type M, Class 25 or Class 50 as required by joint design, for Use T
  - 2.3.5.2 Location: Interior isolation joints in cast-in-place concrete slabs.
  - 2.3.5.3 Acceptable Products:
    - .1 Dow Chemical of Canada ULC
      - .1 Dowsil 790
    - .2 Pecora Corporation
      - .1 301 NS
      - .2 311 NS
      - .3 300 SL
      - .4 310 SL
    - .3 Tremco Incorporated
      - .1 Spectrem 800/900SL
    - .4 Sika Canada Inc.
      - .1 Sikaflex - 1CSL
      - .2 Sikaflex 2C SL
- 2.3.6 Sealant Type: Single-Component or Multicomponent, Traffic-Grade, Silicone or Urethane Joint Sealant
  - 2.3.6.1 Specification: ASTM C920, Type S or Type M, Class 25 or Class 50 as required by joint design, for Use T
  - 2.3.6.2 Location: Interior traffic joints as follows:
    - .1 Other joints as indicated on Drawings and Schedules.
  - 2.3.6.3 Acceptable Product: As recommended by flooring manufacturer and conforming to TTMAC guidelines
- 2.3.7 Sealant Type: Single-Component Silicone or butyl rubber sealant
  - 2.3.7.1 Specification: ASTM C920, Grade NS, Class 25 or ASTM C1311
  - 2.3.7.2 Location: Concealed sealants for bedding thresholds and sills.
  - 2.3.7.3 Acceptable Products:
    - .1 Dow Chemical of Canada ULC
      - .1 Dowsil 758
    - .2 Tremco Incorporated
      - .1 Tremco Butyl Sealant
    - .3 Pecora Corporation
      - .1 BC-158
      - .2 BA-98
- 2.3.8 Sealant Type: Silicone glazing sealant
  - 2.3.8.1 Specification: ASTM C920, Type S, Grade NS, Class 25, Use NT

2.3.8.2 Location: Non-structural sealing for butt-glazing in interior applications and other non-moving glazing joints.

2.3.8.3 Acceptable Product:

- .1 Dow Chemical of Canada ULC
  - .1 Dowsil 799
  - .2 Dowsil Glazing
- .2 GE Silicones (Momentive Performance Materials)
  - .1 UltraGlaze SSG4000
  - .2 UltraGlaze SSG4000AC
- .3 Tremco Incorporated
  - .1 Tremsil 200
- .4 Sika Canada Inc.
  - .1 Sikasil - N Plus

## **2.4 JOINT SEALANT BACKING**

2.4.1 Provide nonstaining sealant backings compatible with joint substrates, sealants, primers, and other joint fillers.

2.4.2 Conform to ASTM C1330:

2.4.2.1 Type C: Closed-cell material with a surface skin.

2.4.2.2 Type B: Bicellular material with a surface skin.

2.4.2.3 Type O: Open-cell material.

2.4.3 Ensure materials are reviewed and approved by the sealant manufacturer based on field experience and laboratory testing for the applications shown in Drawings and Schedules.

2.4.4 Joint-sealant backing must approved in writing by the joint-sealant manufacturer for the specific joint application shown in the Drawings and Schedules.

2.4.5 Provide of size and density to control sealant depth and enhance sealant performance.

2.4.6 Bond-Breaker Tape: polyethylene tape or other plastic tape as recommended by the sealant manufacturer to prevent sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at the back of the joint.

2.4.6.1 Provide self-adhesive tape where necessary.

## **2.5 AUXILIARY MATERIALS**

2.5.1 Primer: as recommended by the joint-sealant manufacturer for ensuring adhesion of sealant to joint substrates.

2.5.2 Cleaners for Nonporous Surfaces: Must me the following criteria:

2.5.2.1 Acceptable to sealant and sealant backing material manufacturers.

2.5.2.2 Free from oily residues or substances that could stain or damage joint substrates and adjacent nonporous surfaces.

2.5.2.3 Formulated to enhance sealant adhesion to joint substrates.



- 2.5.3 Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- 3.1.1 Verify actual site conditions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.

### **3.2 PREPARATION**

- 3.2.1 Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
- 3.2.1.1 Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
  - 3.2.1.2 Clean concrete, masonry, unglazed surfaces of tile, and similar porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
  - 3.2.1.3 Remove laitance and form-release agents from concrete.
  - 3.2.1.4 Clean metal, glass, porcelain enamel, glazed surfaces of tile, and other nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- 3.2.2 Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated on Drawings and Schedules by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- 3.2.3 Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

### **3.3 INSTALLATION**

- 3.3.1 Installation, generally: Install work of this Section in strict accordance with manufacturer's written installation instructions and reviewed Shop Drawings. Supplement manufacturer's installation instructions with additional installation requirements specified in this Section to produce specified work results.
- 3.3.2 Sealant Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated on Drawings and Schedules.
- 3.3.3 Install sealant backings as recommended by joint sealant manufacturer to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
  - 3.3.3.1 Do not leave gaps between ends of sealant backings.
  - 3.3.3.2 Do not stretch, twist, puncture, or tear sealant backings.
  - 3.3.3.3 Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- 3.3.4 Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints to prevent three-sided adhesion.
- 3.3.5 Install sealants using proven techniques that comply with the following and at the same time backings are installed:
  - 3.3.5.1 Place sealants so they directly contact and fully wet joint substrates.
  - 3.3.5.2 Completely fill recesses in each joint configuration.
  - 3.3.5.3 Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- 3.3.6 Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated on Drawings and Schedules; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
  - 3.3.6.1 Remove excess sealant from surfaces adjacent to joints.
  - 3.3.6.2 Use tooling agents that are approved in writing by sealant manufacturer and that do not discolour sealants or adjacent surfaces.
  - 3.3.6.3 Provide concave joint profile per Figure 8A in ASTM C1193, unless otherwise indicated on Drawings and Schedules.
  - 3.3.6.4 Provide flush joint profile where indicated on Drawings and Schedules per Figure 8B in ASTM C1193.
  - 3.3.6.5 Provide recessed joint configuration of recess depth and at locations indicated per Figure 8C in ASTM C1193.
    - .1 Use masking tape to protect surfaces adjacent to recessed tooled joints.
- 3.3.7 Acoustical Sealant Installation: At sound-rated assemblies and elsewhere as indicated on Drawings and Schedules, seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of

acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C919 and with manufacturer's written recommendations.

### **3.4 PROTECTION**

- 3.4.1 Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Performance of the Work. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from the original work.

### **3.5 CLEANING AND WASTE MANAGEMENT**

- 3.5.1 Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.
- 3.5.2 Cleaning: Maintain clean construction area at the end of each day. When activities of this Section are complete, remove materials, tools, equipment and rubbish.
- 3.5.3 Waste Management and Disposal: sort waste for reuse, recycling, or disposal, as specified. Remove recycling bins and containers from site and dispose of contents at the appropriate waste disposal facilities.

**END OF SECTION**

## **PART 1      GENERAL**

### **1.1      GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.
- 1.1.2 Contractor is solely responsible for dividing the Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of the Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2      SUMMARY**

- 1.2.1 Provide labour, materials, Products, equipment and services to complete the steel doors and frames work specified herein. This includes, but is not necessarily limited, to:
  - 1.2.1.1 Interior hollow-metal doors and frames
  - 1.2.1.2 Auxiliary materials required for a complete installation.
- 1.2.2 Related Requirements: Specifications throughout all Divisions of the Project shall be read as a whole and may be directly applicable to this Section. Related requirements provided below are for convenience purposes only:
  - 1.2.2.1 Section 08 71 00 - Door Hardware

### **1.3      REFERENCES**

- 1.3.1 Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply.

### **1.4      DEFINITIONS**

- 1.4.1 Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

### **1.5      PREINSTALLATION MEETINGS**

- 1.5.1 Project Meetings, generally: in accordance with Section 01 31 19, Project Meetings.
- 1.5.2 Pre-installation Meetings: Schedule and hold a pre-installation meeting at the Project site at least one week before beginning work on this Section to coordinate activities with related Subcontractors.
  - 1.5.2.1 Required Attendance: Subcontractor performing work of this Section, representatives from manufacturers and fabricators involved in or affected by installation.
  - 1.5.2.2 Notification: Notify Consultant and Owner of scheduled meeting dates in advance; minimum 72 hour notice required.

- 1.5.2.3 Agenda:
  - .1 Review progress of related construction activities and preparations for particular activity under consideration.
  - .2 Make note of required sequencing and coordination with materials and activities that have preceded or will follow.
- 1.5.2.4 Reporting: Record significant discussions, agreements, and disagreements, including required corrective measures and actions.
- 1.5.2.5 Distribution: Distribute minutes of the meeting to each party present and to other parties requiring information not more than 72 hours after meeting.
- 1.5.3 Coordination
  - 1.5.3.1 Coordinate anchorage installation for Pressed Steel Frames. Supply setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

## **1.6 SUBMITTALS**

- 1.6.1 Submittals, generally: in accordance with Section 01 33 00, Submittal Procedures.
- 1.6.2 Product Data: Submit manufacturer's product characteristics, catalogue cuts, installation instructions and other relevant information for each material and product used for steel doors and frames work specified in this Section.
  - 1.6.2.1 Include construction details, material descriptions, core descriptions, fire-resistance ratings, and finishes.
- 1.6.3 Shop Drawings: Submit Shop Drawings indicating material layouts, details of construction, connections, and relationship with adjacent construction. As a minimum indicate following:
  - 1.6.3.1 Indicate each type of door, frame, steel, construction and core clearly demonstrating the following:
    - .1 Elevations of each door type.
    - .2 Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
    - .3 Frame details for each frame type, including dimensioned profiles and metal thicknesses.
    - .4 Locations of reinforcement and preparations for hardware.
    - .5 Details of each different wall opening condition.
    - .6 Details of anchorages, joints, field splices, and connections.
    - .7 Details of accessories.
    - .8 Details of moldings, removable stops, and glazing.
    - .9 Details of conduit and preparations for power, signal, and control systems.

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- 1.6.3.2 Indicate material thickness, mortises, reinforcements, anchorages, locations of exposed fasteners, openings (glazed, paneled or louvered) and arrangement of standard hardware.
  - 1.6.3.3 Include schedule identifying each unit, with door marks and numbers relating to Consultant's numbering on Drawings and Door Schedule.
  - 1.6.4 Embodied Carbon / Environmental Product Declarations (EPDs): When available, submit product-specific or industry-wide EPDs conforming to ISO 14025 or other recognized environmental Product declaration framework meeting following criteria:
    - 1.6.4.1 EPD Scope: Must cover Cradle-to-Gate (A1 to A3) as a minimum.
    - 1.6.4.2 EPD Impact Categories: Must report Global Warming Potential (GWP) in form of unit of kgCO<sub>2</sub>e/declared unit as a minimum.
    - 1.6.4.3 Product Options: Give preference to Products with compliant documentation when choice is at Contractor's option.
  - 1.6.5 Material Ingredient Disclosure: When available, submit documentation disclosing chemical inventory of materials to at least 0.1% (1000ppm) meeting following criteria:
    - 1.6.5.1 Standard: Health Product Declaration (HPD) Open Standard, Cradle to Cradle v2 (Basic level) or Cradle to Cradle v3 (Bronze level), International Living Future Institute (ILFI) Declare, or other approved material ingredient declaration framework.
    - 1.6.5.2 Product Options: Give preference to Products with compliant documentation when choice is at Contractor's option.
  - 1.6.6 Low-Emitting Materials: For applicable Products specified or used for activities of this Section (i.e., site-applied coatings, adhesives, and sealants), submit certifications from third-party organizations indicating compliance with following:
    - 1.6.6.1 VOC Emissions: California Department of Public Health (CDPH) Standard Method v1.2–2017, using applicable exposure scenario.
    - 1.6.6.2 VOC Content: SCAQMD Rule 1113 (for paints and coatings) and SCAQMD Rule 1168 (for adhesives and sealants).
  - 1.6.7 Samples:
    - 1.6.7.1 When requested by Consultant, submit fabrication Samples approximately 203 by 254 mm (8 by 10 inches) to demonstrate compliance with requirements for quality of materials and construction:
      - .1 Doors: Show vertical-edge, top, and bottom construction; core construction; and hinge and other applied hardware reinforcement. Include separate section showing glazing if applicable.
      - .2 Frames: Show profile, corner joint, floor and wall anchors, and silencers. Include separate section showing fixed hollow-metal panels and glazing if applicable.
  - 1.6.8 Schedule: Provide a schedule of hollow-metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final Door Hardware Schedule.

- 1.6.9 Welding Certificate: Submit certification for welding firms and welders to verify compliance with welding qualifications specified in this section.
- 1.6.10 Product Test Reports: Submit product test reports for each type of hollow-metal door and frame assembly, for tests performed by a qualified testing agency.
  - 1.6.10.1 Ensure reports include name of testing authority, date of test, location of test facility, descriptions of test specimens, procedures used in testing and indicate compliance with acceptance criteria of test.

## **1.7 CLOSEOUT SUBMITTALS**

- 1.7.1 Closeout Submittals, generally: in accordance with Section 01 78 00, Closeout Submittals.
- 1.7.2 Warranty Documentation: Submit copy of extended warranties specified in this Section.

## **1.8 QUALITY ASSURANCE**

- 1.8.1 Manufacturer Qualifications: Provide Products for work of this Section by manufacturer with at least 10 years' experience manufacturing such materials.
  - 1.8.1.1 Execute work in this Section by a manufacturer who is a member of CSDMA or NAAMM.
  - 1.8.1.2 Ensure product is manufactured by a firm experienced in design and production of standard and custom commercial steel door and frame assemblies, integration of builders' or electronic hardware and glazing assemblies, and other items affecting work.
- 1.8.2 Installer Qualifications: Engage an entity with at least five years' experience installing, erecting, or assembling work similar in material, design, and extent to that shown on Drawings and Schedules, and whose work has resulted in construction with a track record of successful in-service performance.
  - 1.8.2.1 Ensure retained installers are familiar with Product manufacturers specified herein and with ANSI/NFPA 80 requirements for installation of labeled fire rated steel doors, frames and hardware.
- 1.8.3 Welding Qualifications: Qualify procedures and personnel in accordance with the following:
  - 1.8.3.1 Steel: to CSA W47.1 and CSA W59
  - 1.8.3.2 Aluminum: to CSA W47.2 and CSA W59.2
  - 1.8.3.3 Stainless Steel: to CSA W47.1 (Annex K) and CSA W59.
- 1.8.4 Single Source Responsibility: Obtain primary materials for this Section from a single source by a single manufacturer, and secondary materials from sources recommended by manufacturers of primary materials.
- 1.8.5 Mock-Ups / First Installation Review: Construct mock-ups to verify selections made under submittals, demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
  - 1.8.5.1 Location: In-situ (i.e. first installation), as directed on site by Consultant.

- 1.8.5.2 Purpose: To set benchmarks for installation and to judge subsequent work. Maintain Mock-ups during construction in undisturbed condition.
- 1.8.5.3 Reviewed mock-ups: May become part of the completed work if undisturbed at the time of Substantial Performance of The Work, provided they are undisturbed, and comply with requirements outlined in Contract Documents.

## **1.9 DELIVERY, STORAGE AND HANDLING**

- 1.9.1 Product Requirements, generally: in accordance with Section 01 61 00, Common Product Requirements.
- 1.9.2 Deliver, store and handle steel doors and frames materials in accordance with manufacturer's written instructions.
- 1.9.3 Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- 1.9.4 Provide site storage and protection of materials in accordance with NAAMM-HMMA 840. Store items in dry, secure location on planks or dunnage.
- 1.9.5 For welded frames, weld in two temporary jamb spreaders per door opening to maintain proper alignment during shipment and handling. Do not use temporary jamb spreaders for installation.
- 1.9.6 Store materials off-ground, in clean, dry, well-ventilated area.
- 1.9.7 Replace defective or damaged materials with new.

## **1.10 FIELD CONDITIONS**

- 1.10.1 Verify actual opening sizes and field conditions by field measurement before fabrication. Submittal drawings must reflect measurements and conditions provided, and product manufactured accordingly. Coordinate field measurements with fabrication and construction schedules to avoid delays.
- 1.10.2 Verify that substrate conditions, whether existing or otherwise, are as detailed on Drawings, and are acceptable for product installation in accordance with manufacturer's instructions.
- 1.10.3 Do not proceed with fabrication without receipt of reviewed Shop Drawings and reviewed construction hardware schedule.

## **1.11 WARRANTY**

- 1.11.1 Extended warranty: Submit for Owner's review and acceptance, manufacturer's extended warranty in which manufacturer commits to repair or replace components of steel doors and frames that fail within specified warranty period. Manufacturer's extended warranty is in addition to, and does not supersede, any other rights that Owner may have under Contract Documents.
  - 1.11.1.1 Warranty Period: Not less than 5 years from date of Substantial Performance of The Work.
- 1.11.2 Extended Rust-perforation Warranty: Standard manufacturer's standard form in which manufacturer agrees to repair finishes or replace doors that show evidence of excessive rusting within specified warranty period.



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## **PART 2      PRODUCTS**

### **2.1      MANUFACTURERS**

2.1.1 Provided requirements of Contract Documents are satisfied, the following manufacturers may supply Products for work this Section:

- 2.1.1.1 All Steel Doors 2000 Ltd
- 2.1.1.2 Ambico Limited
- 2.1.1.3 Apex Industries Inc.
- 2.1.1.4 Artek Door Ltd.
- 2.1.1.5 Daybar Industries Ltd
- 2.1.1.6 Fleming-Baron Door Products; an Assa Abloy Group company.
- 2.1.1.7 Gensteel Doors
- 2.1.1.8 LMT Group inc.
- 2.1.1.9 M.J. Daley Manufacturing Co. Ltd.
- 2.1.1.10 Metal Door Ltd.
- 2.1.1.11 Métalec Portes & Cadres d'Acier
- 2.1.1.12 Shanahan's Limited Partnership
- 2.1.1.13 Trillium Steel Doors Ltd.
- 2.1.1.14 Vision Hollow Metal Limited

### **2.2      PERFORMANCE / DESIGN CRITERIA**

2.2.1 Door Construction, generally:

- 2.2.1.1 Construct doors to meet requirements of NAAMM-HMMA 861 and CSDMA. Ensure door and frame products are fabricated according to reviewed Shop Drawings. Ensure steel is free of scale, pitting, coil breaks, surface blemishes, buckles, waves and other defects.
- 2.2.1.2 Door Thickness: Unless otherwise indicated, construct doors to be minimum 44.5 mm (1-3/4 inches) thick.

2.2.2 Electrical Coordination: Design door assemblies to facilitate easy removal and replacement of conduits and wiring associated with electrical components.

2.2.3 Fire-rated doors and frames:

- 2.2.3.1 Fire-Rated Door Assemblies: tested in accordance with CAN/ULC-S104 by a qualified testing agency acceptable to the authorities having jurisdiction for fire-protection ratings and temperature-rise limits indicated on Drawings and Schedules.
- 2.2.3.2 Fire-Rated Frame Assemblies: tested in accordance with CAN/ULC-S105 (frames) and CAN/ULC-106 (windows and sidelites) by a qualified testing agency acceptable to the authorities having jurisdiction for fire-protection ratings and temperature-rise limits indicated on Drawings and Schedules.
- 2.2.3.3 Smoke- and Draft-Control Assemblies: to UL 1784.
- 2.2.3.4 Temperature Rise Rated Doors: comply with Ontario Building Code Table 3.1.8.15. Ensure core composition provides required fire-

protection rating and limits temperature rise on unexposed side of door to 250°C at 30 or 60 minutes, as determined by applicable Building Code.

- .1 Cores must be tested as part of a complete door assembly, in accordance with CAN/ULC-S104 and listed by a nationally recognized testing agency.

2.2.3.5 Ensure doors are constructed as listed in the "Follow-Up Service Procedures/Factory Inspection Manuals" provided by the listing agency.

2.2.3.6 Label Provision: Provide labels from a recognized testing agency that includes factory inspection service. Labels must comply with NFPA 80 and comply with listing authority's policies and label materials.

- .1 Manufacturer Identification: Labels must clearly identify manufacturer.

## **2.3 MATERIALS**

2.3.1 Galvanized / Galvannealed Steel Sheet: ASTM A653/A 653M, Commercial Steel (CS), Type B.

2.3.1.1 Interior doors and frames, unless indicated otherwise: Designation ZF 120 (A40)

2.3.2 Frame Anchors: ASTM A879/A 879M, Commercial Steel (CS), 12G (04Z) coating designation; mill phosphatized. For anchors built into exterior walls, steel sheet complying with ASTM A1008/A 1008M or ASTM A1011/A 1011M, hot-dip galvanized according to ASTM A153/A 153M, Class B.

## **2.4 INTERIOR DOORS AND FRAMES - MEDIUM-DUTY**

2.4.1 Door Construction:

2.4.1.1 Materials: 1.06 mm (18 ga) metallic-coated steel sheet, galvannealed.

2.4.1.2 Edge Construction: Seamless (continuously welded and ground smooth).

2.4.1.3 Core: rigid extruded fire retardant, closed cell polystyrene board with 16 to 32 kg/m<sup>3</sup> (1 to 2 pcf) density. Type 1 to ASTM C578

2.4.1.4 Basis-of-Design: "CW-Series" by Fleming.

2.4.2 Frame Construction:

2.4.2.1 Materials: 1.34 mm (16 ga) metallic-coated steel sheet, galvannealed.

2.4.2.2 Construction: Face welded unless specified otherwise.

2.4.3 Basis-of-Design:

2.4.3.1 "M Series" by Fleming for masonry construction.

2.4.3.2 "DW Series" by Fleming for gypsum board construction.

2.4.3.3 "EXP Series" by Fleming for existing partitions.

2.4.4 Finish: Factory-primed for site finishing.

2.4.5 General locations: Private offices, private washrooms, janitor closets, and similar locations as noted on Drawings.

## **2.5 INTERIOR DOORS AND FRAMES - HEAVY-DUTY**

- 2.5.1 Door Construction:
  - 2.5.1.1 Materials: 1.34 mm (16 ga) metallic-coated steel sheet, galvanized.
  - 2.5.1.2 Edge Construction: Seamless (continuously welded and ground smooth).
  - 2.5.1.3 Core: Laminated, vertical steel stiffened at 150 mm (6 in) o.c. maximum.
  - 2.5.1.4 Basis-of-Design: "H-Series" by Fleming.
- 2.5.2 Frame Construction:
  - 2.5.2.1 Materials: 1.34 mm (16 ga) metallic-coated steel sheet, galvanized.
  - 2.5.2.2 Construction: Face welded or full profile welded.
- 2.5.3 Basis-of-Design:
  - 2.5.3.1 "M Series" by Fleming for masonry construction.
  - 2.5.3.2 "DW Series" by Fleming for gypsum board construction.
  - 2.5.3.3 "EXP Series" by Fleming for existing partitions.
- 2.5.4 Finish: Factory-primed for site finishing.
- 2.5.5 Locations: Public stairwells, corridors, public bathrooms, emergency exit doors, and similar locations as noted on Drawings.

## **2.6 LEAD-LINING**

- 2.6.1 Refer to Section 13 49 00 – Radiation Shielding System.

## **2.7 FABRICATION, GENERALLY**

- 2.7.1 Ensure all hollow-metal components are rigid and free of defects, such as warping or buckling.
- 2.7.2 Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- 2.7.3 Hardware Preparation: Prepare doors and frames in factory for hardware, including mortising, blanking, drilling, and tapping for templated hardware only.
  - 2.7.3.1 Reinforce doors and frames in the factory where required for surface-mounted hardware, including anchor hinges, thrust pivots, pivot-reinforced hinges, or non-templated hardware. Perform drilling and tapping on site during installation.
  - 2.7.3.2 Prepare hollow-metal components in the factory for templated mortised hardware according to SDI A250.6, CSDMA Specifications, and the Door Hardware Schedule. Include cutouts, reinforcement, mortising, drilling, and tapping as required.
  - 2.7.3.3 Electrified Hardware: Provide CSA-approved system, including conduit, junction boxes, and wire harnesses, for electrified hardware as specified on Hardware Schedule.

- 2.7.4 Provide accurately fitted stops and moldings for glazed lites and louvers where indicated on Drawings and Schedules. Form corners with butted hairline joints.
- 2.7.5 Minimum thickness for reinforcements:
  - 2.7.5.1 Lock and Strike Reinforcements: 1.52 mm (16 ga)
  - 2.7.5.2 Hinge Reinforcements: 2.66 mm (12 ga)
  - 2.7.5.3 Flush Bolt Reinforcements: 1.52 mm (16 ga)
  - 2.7.5.4 Reinforcements for Surface Applied Hardware: 1.22 mm (18 ga)
  - 2.7.5.5 Top and Bottom Channels: 1.22 mm (18 ga)
  - 2.7.5.6 Steel Top Caps: 0.95 mm (20 ga)
  - 2.7.5.7 Glass Trim (Screw Fixed or Snap-In Types): 0.95 mm (20 ga)
  - 2.7.5.8 Mortar Guard Boxes: 0.79 mm (22 ga)
  - 2.7.5.9 Floor Anchors: 1.52 mm (16 ga)
  - 2.7.5.10 Wall Anchors:
    - .1 Masonry Strap Type: 1.22 mm (18 ga)
    - .2 Masonry Wire Type: 4.0 mm (0.156 in) dia.
    - .3 Masonry Stirrup-Strap Type: 1.52 mm (16 ga)
    - .4 Steel/Wood Stud Type: 0.95 mm (20 ga)
    - .5 Steel/Wood Stud Tension and Associated Wall Type: 0.95 mm (20 ga)
    - .6 Existing Masonry/Concrete Wall Type: 0.95 mm (20 ga)
  - 2.7.5.11 Jamb Spreaders: 0.95 mm (20 ga)

## **2.8 FRAME FABRICATION**

- 2.8.1 Hardware Preparation: Frames must be mortised, blanked, reinforced, drilled, and tapped at the factory for templated hardware in accordance with reviewed hardware schedule and templates provided by hardware supplier.
  - 2.8.1.1 Non-Templated Hardware: Reinforce as required; drilling and tapping to be done on-site during installation.
- 2.8.2 Anchorage: Provide suitable anchors based on floor, wall, and frame construction. Position anchors above or below each hinge reinforcement.
  - 2.8.2.1 For frames in concrete, masonry, or structural steel, anchors must be not than 150 mm (6") from top and bottom of each jamb, with intermediate anchors spaced not more than 660 mm (26") apart.
- 2.8.3 Reinforcements and Silencers: Provide minimum reinforcing, anchor, and other component gas in accordance with CSDMA's "Recommended Specifications for Commercial Steel Door and Frame Products."
- 2.8.4 Prepare each door opening for rubber door silencers: Provide three for single doors, two for double doors, except on gasketed frames.
- 2.8.5 Primer: Apply touch-up primer where zinc coating has been removed.
- 2.8.6 Identification: Mark each frame product with an identification number before shipment, corresponding to the reviewed Shop drawings.

**2.8.7 Welded Type Frames:**

- 2.8.7.1 Construction: Frame corners to be accurately mitered or mechanically jointed. Welds to conform to CSA W59 standards.
- 2.8.7.2 Install floor anchors in frames before adjacent partitions are installed.
- 2.8.7.3 Provide temporary jamb spreaders welded in place during shipping; do not use for installation.

2.8.8 Glazing Stops: Provide formed steel channel glazing stops with minimum height of 16 mm (0.625"), fastened with countersunk screws.

2.8.9 Large Opening: For large openings, fabricate frames in sections, with splice joints for field assembly and welding.

**2.9 DOOR FABRICATION**

- 2.9.1 Hardware Preparation: Provide doors factory-prepared for templated hardware. Ensure holes 12.7 mm (0.5 in) and larger are factory drilled. Smaller holes are to be prepared as necessary for device function.
- 2.9.2 Reinforcement and Channels: Reinforce doors as required for non-templated hardware; drilling and tapping to be done on-site during installation.
- 2.9.3 Ensure top and bottom of doors are provided with inverted, recessed, welded steel channels. Exterior doors, and where otherwise scheduled by Consultant to be provided with flush PVC top caps.
- 2.9.4 Identification: Mark each door product with an identification number before shipment, corresponding to the reviewed Shop drawings.

**PART 3 EXECUTION****3.1 EXAMINATION**

- 3.1.1 Verify actual site conditions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.
- 3.1.2 Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.

**3.2 PREPARATION**

- 3.2.1 Remove welded-in temporary shipping bars installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- 3.2.2 Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

**3.3 INSTALLATION**

- 3.3.1 Installation, generally: Install work of this Section in strict accordance with manufacturer's written installation instructions and reviewed Shop Drawings.

Supplement manufacturer's installation instructions with additional installation requirements specified in this Section to produce specified work results.

- 3.3.2 Steel Frames: Install Pressed Steel Frames of size and profile indicated on Drawings and Schedules. Comply with NAAMM-HMMA 840 and CSDMA Specifications as required by standards specified.

- 3.3.2.1 Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
- .1 At fire-rated openings, install frames according to NFPA 80.
  - .2 Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
  - .3 Install frames with removable stops located on secure side of opening.
  - .4 Install door silencers in frames before grouting.
  - .5 Remove temporary braces necessary for installation only after frames have been properly set and secured.
  - .6 Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
  - .7 Field apply bituminous coating to backs of frames that will be filled with grout agents.
- 3.3.2.2 Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with anchors.
- 3.3.2.3 Metal-Stud Partitions: Solidly pack mineral-fiber insulation inside frames.
- 3.3.2.4 Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
- 3.3.2.5 Concrete Walls: Solidly fill space between frames and concrete with mineral-fiber insulation.
- 3.3.2.6 In-Place Concrete or Masonry Construction: Secure frames in place with anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
- 3.3.2.7 In-Place Stud Partitions: Secure slip-on drywall frames in place according to manufacturer's written instructions.
- 3.3.2.8 Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
- .1 Squareness: Plus or minus 1.6 mm (1/16 inch), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.

- .2 Alignment: Plus or minus 1.6 mm (1/16 inch), measured at jambs on a horizontal line parallel to plane of wall.
  - .3 Twist: Plus or minus 1.6 mm (1/16 inch), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
  - .4 Plumbness: Plus or minus 1.6 mm (1/16 inch), measured at jambs at floor.
- 3.3.3 Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
- 3.3.3.1 Non-Fire-Rated Steel Doors:
- .1 Between Door and Frame Jambs and Head: 3.2 mm (1/8 inch) plus or minus 1.5 mm (1/16 inch).
  - .2 Between Edges of Pairs of Doors: 3.2 mm (1/8 inch) plus or minus 1.5 mm (1/16 inch).
  - .3 At Bottom of Door: Provide floor clearance for functional operation of doors of not less than 3.2 mm (1/8 inch) plus or minus 1.5 mm (1/16 inch), unless greater undercuts are indicated on Door Schedule or required for mechanical air flow.
- 3.3.3.2 Fire-Rated Doors: Install doors with clearances according to NFPA 80.
- 3.3.3.3 Smoke-Control Doors: Install doors and gaskets according to NFPA 105.
- 3.3.4 Glazing: Comply with installation requirements in Section 08 81 26 and with hollow-metal manufacturer's written instructions.
- 3.3.4.1 Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 230 mm (9 inches) o.c. and not more than 51 mm (2 inches) o.c. from each corner.

### **3.4 PROTECTION**

- 3.4.1 Protect steel doors and frames from damage, soiling and contaminating substances resulting from construction activities or caused by work of other trades.
- 3.4.2 Where soiling or spills have occurred, remove spills and soiling from adjacent surfaces using cleaning procedures recommended in writing by affected material's manufacturer. Do not use materials or processes that can damage finishes, surfaces, or construction.
- 3.4.3 Promptly replace steel doors and frames work damaged during construction that cannot be satisfactorily repaired.

### **3.5 ADJUSTING**

- 3.5.1 Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.

3.5.2 Remove grout and other bonding material from hollow-metal work immediately after installation.

3.5.3 Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

### **3.6 CLEANING AND WASTE MANAGEMENT**

3.6.1 Cleaning: Maintain clean construction area at the end of each day. When activities of this Section are complete, remove materials, tools, equipment and rubbish.

3.6.2 Waste Management and Disposal: sort waste for reuse, recycling, or disposal, as specified. Remove recycling bins and containers from site and dispose of contents at the appropriate waste disposal facilities.

**END OF SECTION**



## **PART 1      GENERAL**

### **1.1      GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.
- 1.1.2 Contractor is solely responsible for dividing the Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of the Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2      SUMMARY**

- 1.2.1 Provide labour, materials, Products, equipment and services to complete the flush wood doors work specified herein. This includes, but is not necessarily limited, to:
  - 1.2.1.1 Flush wood doors with plastic laminate finish.
  - 1.2.1.2 Wood lead-lined doors.
  - 1.2.1.3 Flush wood doors with opaque / painted finish.
  - 1.2.1.4 Auxiliary materials required for a complete installation.
- 1.2.2 Related Requirements: Specifications throughout all Divisions of the Project shall be read as a whole and may be directly applicable to this Section.

### **1.3      REFERENCES**

- 1.3.1 Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply.

### **1.4      DEFINITIONS**

- 1.4.1 Transparent Finish: A stain or a clear finish that allows the natural characteristics and color of the grain of the wood surface to show through the finish
- 1.4.2 Opaque Finish: A paint or pigmented stain finish that hides the natural characteristics and color of the grain of the wood surface and is not transparent.

### **1.5      ADMINISTRATIVE REQUIREMENTS**

- 1.5.1 Pre-installation Meetings: Schedule and hold a pre-installation meeting at the Project site at least one week before beginning work on this Section to coordinate activities with related Subcontractors.
  - 1.5.1.1 Required Attendance: Subcontractor performing work of this Section, representatives from manufacturers and fabricators involved in or affected by installation.

- 1.5.1.2 Notification: Notify Consultant and Owner of scheduled meeting dates in advance; minimum 72 hour notice required.

## **1.6 SUBMITTALS**

- 1.6.1 Submittals, generally: in accordance with Section 01 33 00, Submittal Procedures.
- 1.6.2 Product Data: Submit manufacturer's product characteristics, catalogue cuts, installation instructions and other relevant information for each material and product used for flush wood doors work specified in this Section.
- 1.6.3 Shop Drawings: Submit Shop Drawings indicating material layouts, details of construction, connections, and relationship with adjacent construction. As a minimum indicate following:
  - 1.6.3.1 Location, size, thickness, and hand of each door.
  - 1.6.3.2 Elevation details for each door type.
  - 1.6.3.3 Construction details not covered in Product Data.
  - 1.6.3.4 Location and extent of hardware blocking.
  - 1.6.3.5 Undercuts, special beveling, and any other relevant specifications.
  - 1.6.3.6 Dimensions and locations of mortises and holes for factory-machined hardware.
  - 1.6.3.7 Dimensions and locations of cutouts.
  - 1.6.3.8 Aesthetic and finish requirements.
  - 1.6.3.9 Fire label requirements, including fire rating duration, maximum temperature rise, and smoke label requirements.
  - 1.6.3.10 Routing of electrical conduit and dimensions and locations of cutouts in wood doors to accommodate electric hardware devices.
- 1.6.4 Embodied Carbon / Environmental Product Declarations (EPDs): When available, submit product-specific or industry-wide EPDs conforming to ISO 14025 or other recognized environmental Product declaration framework meeting following criteria:
  - 1.6.4.1 EPD Scope: Must cover Cradle-to-Gate (A1 to A3) as a minimum.
  - 1.6.4.2 EPD Impact Categories: Must report Global Warming Potential (GWP) in form of unit of kgCO<sub>2</sub>e/declared unit as a minimum.
  - 1.6.4.3 Product Options: Give preference to Products with compliant documentation when choice is at Contractor's option.
- 1.6.5 Material Ingredient Disclosure: When available, submit documentation disclosing chemical inventory of materials to at least 0.1% (1000ppm) meeting following criteria:
  - 1.6.5.1 Standard: Health Product Declaration (HPD) Open Standard, Cradle to Cradle v2 (Basic level) or Cradle to Cradle v3 (Bronze level), International Living Future Institute (ILFI) Declare, or other approved material ingredient declaration framework.
  - 1.6.5.2 Product Options: Give preference to Products with compliant documentation when choice is at Contractor's option.

- 1.6.6 Low-Emitting Materials: For applicable Products specified or used for activities of this Section (i.e., site-applied coatings, adhesives, and sealants), submit certifications from third-party organizations indicating compliance with following:
  - 1.6.6.1 VOC Emissions: California Department of Public Health (CDPH) Standard Method v1.2–2017, using applicable exposure scenario.
  - 1.6.6.2 VOC Content: SCAQMD Rule 1113 (for paints and coatings) and SCAQMD Rule 1168 (for adhesives and sealants).
- 1.6.7 Samples: Submit selection and verification samples for Products requiring colour, texture, or design selection. Submit manufacturer's list of finishes or colour swatches for Consultant's selection.
  - 1.6.7.1 As a minimum submit samples of the following:
    - .1 Corner sections of doors, approximately 200 by 250 mm (8 by 10 inches), with door faces and edges representing actual materials to be used.
    - .2 Frames for light openings, 150 mm (6 inches) long, for each material, type, and finish required.

## **1.7 CLOSEOUT SUBMITTALS**

- 1.7.1 Closeout Submittals, generally: in accordance with Section 01 78 00, Closeout Submittals.
- 1.7.2 Warranty Documentation: Submit copy of extended warranties specified in this Section.

## **1.8 QUALITY ASSURANCE**

- 1.8.1 Manufacturer Qualifications: Provide Products for work of this Section by manufacturer with at least 10 years' experience manufacturing such materials.
- 1.8.2 Installer Qualifications: Engage an entity with at least five years' experience installing, erecting, or assembling work similar in material, design, and extent to that shown on Drawings and Schedules, and whose work has resulted in construction with a track record of successful in-service performance.
- 1.8.3 Single Source Responsibility: Obtain primary materials for this Section from a single source by a single manufacturer, and secondary materials from sources recommended by manufacturers of primary materials.
- 1.8.4 Mock-Ups / First Installation Review: Construct mock-ups to verify selections made under submittals, demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
  - 1.8.4.1 Location: In-situ (i.e. first installation), as directed on site by Consultant.
  - 1.8.4.2 Purpose: To set benchmarks for installation and to judge subsequent work. Maintain Mock-ups during construction in undisturbed condition.
  - 1.8.4.3 Reviewed mock-ups: May become part of the completed work if undisturbed at the time of Substantial Performance of The Work, provided they are undisturbed, and comply with requirements outlined in Contract Documents.

**1.9 DELIVERY, STORAGE AND HANDLING**

- 1.9.1 Product Requirements, generally: in accordance with Section 01 61 00, Common Product Requirements.
- 1.9.2 Deliver, store and handle flush wood doors materials in accordance with manufacturer's written instructions.
- 1.9.3 Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- 1.9.4 Store materials off-ground, in clean, dry, well-ventilated area.
- 1.9.5 Replace defective or damaged materials with new.
- 1.9.6 Package doors individually in cardboard cartons and wrap bundles of doors in plastic sheeting.
- 1.9.7 Mark each door on top and bottom rail with opening number used on Shop Drawings.

**1.10 FIELD CONDITIONS**

- 1.10.1 Environmental Restrictions: Do not deliver or install flush wood doors until building is enclosed, wet work is complete, and HVAC system is operational and will maintain temperature and relative humidity levels equal to occupancy levels for remainder of construction period.
- 1.10.2 Field Measurements: Verify actual dimensions of construction contiguous with flush wood doors by field measurements before fabrication.

**1.11 WARRANTY**

- 1.11.1 Extended warranty: Submit for Owner's review and acceptance, manufacturer's extended warranty in which manufacturer commits to repair or replace components of flush wood doors that fail within specified warranty period. Manufacturer's extended warranty is in addition to, and does not supersede, any other rights that Owner may have under Contract Documents.
  - 1.11.1.1 Failures include, but are not limited to, the following:
    - .1 Delamination of veneer or facing.
    - .2 Warping (bow, cup, or twist) more than 6.4 mm (1/4 inch) in a 1067-by-2134-mm (42-by-84-inch) section.
    - .3 Telegraphing of core construction in face veneers exceeding 0.25 mm in a 76.2-mm (0.01 inch in a 3-inch) span.
  - 1.11.1.2 Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
  - 1.11.1.3 Warranty Period: 5 years from date of Substantial Performance of the Work.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURERS**

- 2.1.1 Provided requirements of Contract Documents are satisfied, the following manufacturers may supply Products for work this Section:
  - 2.1.1.1 Algoma-Marshfield; A Masonite company.
  - 2.1.1.2 Baillargeon; A Masonite company.
  - 2.1.1.3 Lambton Doors.
  - 2.1.1.4 Marshfield Door Systems, Inc.; A Masonite company.
  - 2.1.1.5 Mohawk Doors; a Masonite company.
  - 2.1.1.6 VT Industries, Inc.
- 2.1.2 Substitution Limitations: In accordance with requirements of Section 01 25 00, Substitution Procedures.

### **2.2 PERFORMANCE / DESIGN CRITERIA**

- 2.2.1 Door Construction, generally:
  - 2.2.1.1 Construct doors to meet requirements of WDMA I.S.1-A, "Architectural Wood Flush Doors in accordance with WDMA I.S.1-A Extra Heavy Duty Performance Grade.
  - 2.2.1.2 Door Thickness: Unless otherwise indicated, construct doors to be minimum 44.5 mm (1-3/4 inches) thick.
- 2.2.2 Fire-rated doors:
  - 2.2.2.1 Fire-Rated Door Assemblies: tested in accordance with CAN/ULC-S104 by a qualified testing agency acceptable to the authorities having jurisdiction for fire-protection ratings and temperature-rise limits indicated on Drawings and Schedules.
  - 2.2.2.2 Smoke- and Draft-Control Assemblies: to UL 1784.
  - 2.2.2.3 Temperature Rise Rated Doors: comply with Ontario Building Code Table 3.1.8.15. Ensure core composition provides required fire-protection rating and limits temperature rise on unexposed side of door to 250°C at 30 or 60 minutes, as determined by applicable Building Code.
    - .1 Cores must be tested as part of a complete door assembly, in accordance with CAN/ULC-S104 and listed by a nationally recognized testing agency.
  - 2.2.2.4 Label Provision: Provide labels from a recognized testing agency that includes factory inspection service. Labels must comply with NFPA 80 and comply with listing authority's policies and label materials.
    - .1 Manufacturer Identification: Labels must clearly identify manufacturer.
- 2.2.3 VOC Content and Emissions:

- 2.2.3.1 VOC Emissions: For applicable items in this Section, comply with CDPH Standard Method v1.2–2017 (CA Spec 01350) and ensure products are certified per UL 2818, SCS Global Gold, or equivalent.
- 2.2.3.2 VOC Content Requirements: Wet-applied materials used in scope of this Section must conform to the following:
  - .1 Paints and Coatings: SCAQMD Rule 1113 or CARB SCM.
  - .2 Adhesives and Sealants: SCAQMD Rule 1168.
  - .3 Methylene chloride and perchloroethylene must not be intentionally added in paints, coatings, adhesives, or sealants.
- 2.2.3.3 Composite Wood (if applicable): must be ULEF or NAF type per CARB ATCM. Do not use adhesives that contain urea-formaldehyde.

## **2.3 FLUSH WOOD DOORS WITH PLASTIC-LAMINATE FACES**

- 2.3.1 ANSI/WDMA I.S. 1A Grade: Premium.
- 2.3.2 Construction: Five plies, with stiles and rails bonded to the core, then abrasive planed before applying faces and crossbands. Plastic laminate must extend full height, be directly glued to the crossband, and match door faces on vertical edges.
- 2.3.3 Core: Solid.
- 2.3.4 Plastic-Laminate Faces: High-pressure decorative laminates complying with NEMA LD 3, Grade HGS, minimum 1.27 mm (0.050 in) thick.
- 2.3.5 Colours and Finishes: Refer to Drawings and Schedules.
- 2.3.6 Exposed Vertical Edges: Same species as faces or a compatible species or Matching-edge (ME) or Compatible Edge (CE) complying with WDMA. Veneer edges are not permitted.
- 2.3.7 Basis-of-Design Products:
  - 2.3.7.1 Extra Heavy Duty Applications: "Model No. 8500-ME" or "Model No. 8300-ME" (Agrifibre Core) by Baillargeon Doors.
  - 2.3.7.2 Heavy Duty Applications: "Model No. 8600-ME" by Baillargeon Doors.
  - 2.3.7.3 Fire-Rated Applications: "Model No. RMC 45/60/90" by Baillargeon Doors.

## **2.4 LEAD-LINING**

- 2.4.1 Refer to Section 13 49 00 – Radiation Shielding System.

## **2.5 FLUSH WOOD DOORS WITH OPAQUE / PAINTED FINISH**

- 2.5.1 ANSI/WDMA I.S. 1A Grade: Custom.
- 2.5.2 Construction: Three plies, hot-pressed bonded with MDO faces. Apply MDO to standard-thickness, closed-grain, hardwood face veneers or directly to high-density hardboard crossbands.
- 2.5.3 Core: As noted on Drawings and Schedules.

- 2.5.4 Facing: MDO or hardboard. Ensure facing extends the full height of the door with vertically running grain, tapeless spliced, without voids or show-through (telegraphing), and directly glued to the crossband.
- 2.5.5 Exposed Vertical Edges: Same species as faces or a compatible species or Matching-edge (ME) or Compatible Edge (CE) complying with WDMA. Veneer edges are not permitted.
- 2.5.6 Basis-of-Design Products
  - 2.5.6.1 Extra Heavy Duty Applications: "Model No. 8500-ME" or "Model No. 8300-ME" (Agrifibre Core) by Baillargeon Doors.
  - 2.5.6.2 Heavy Duty Applications: "Model No. 8600-ME" by Baillargeon Doors.
  - 2.5.6.3 Standard Duty Applications: "Model No. 8100-MO / 8120-MO" by Baillargeon Doors.
  - 2.5.6.4 Fire-Rated Applications: "Model No. RMC 45/60/90" by Baillargeon Doors.

## **2.6 FABRICATION**

- 2.6.1 Core Type:
  - 2.6.1.1 Particleboard cores: Provide unless otherwise indicated. Provide ANSI A208.1, Grade 1-LD-2 with no added urea-formaldehyde. Agrifiber cores are acceptable in lieu of particle board cores.
  - 2.6.1.2 Glued-block or structural composite lumber cores: At doors scheduled to receive exit devices.
  - 2.6.1.3 Fire-rated cores: Provide mineral core as required for fire rating indicated on Drawings and Schedules. Ensure core is veneered or faced to match non fire-rated doors.
  - 2.6.1.4 Stiles: Minimum 30 mm (1-3/16 inch) wide hardwood with minimum 22 mm (7/8 inch) Maple or Birch edge strips or SCL. Provide fire-retardant types for fire-rated doors.
  - 2.6.1.5 Rails: Minimum 30 mm (1-3/16 inch) wide softwood or SCL. Provide fire-retardant types for fire-rated doors.
  - 2.6.1.6 Adhesives: Type I, waterproof (urea-formaldehyde free)
  - 2.6.1.7 Crossbands: Minimum 1.6 mm (1/16 inch) thick composite complete with veneer. Provide fire-retardant types for fire-rated doors.
  - 2.6.1.8 Blocking: Provide wood blocking in particleboard-core doors as needed to eliminate through-bolting hardware.
- 2.6.2 Blocking Requirements: Provide wood blocking to eliminate through-bolting hardware and as required by performance grade.
- 2.6.3 Factory fit doors to suit frame-opening sizes indicated.
  - 2.6.3.1 Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
  - 2.6.3.2 Comply with NFPA 80 requirements for fire-rated doors.
- 2.6.4 Factory machine doors for hardware that is not surface applied.
  - 2.6.4.1 Locate hardware to comply with DHI-WDHS-3.

- 2.6.4.2 Coordinate with hardware mortises in metal frames, to verify dimensions and alignment before factory machining.
- 2.6.4.3 For doors scheduled to receive electrified locksets, provide factory-installed raceway and wiring to accommodate specified hardware.
- 2.6.5 Metal Astragals: Factory machine astragals and formed-steel edges for hardware for pairs of fire-rated doors.
- 2.6.6 Sealing: Completely seal all exposed wood edges and edges of cutouts before units are shipped from manufacturer's mill. Apply sealer in accordance with sealer manufacturer's directions.
- 2.6.7 Transom and Side Panels:
  - 2.6.7.1 Fabricate matching panels with same construction, exposed surfaces, and finish as specified for associated doors.
  - 2.6.7.2 Finish bottom edges of transoms and top edges of rabbeted doors same as door stiles.
  - 2.6.7.3 Fabricate door and transom panels with full-width, solid-lumber, rabbeted, meeting rails.
  - 2.6.7.4 Provide factory-installed spring bolts for concealed attachment into jambs of metal door frames.
- 2.6.8 Openings: Factory cut and trim openings through doors.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- 3.1.1 Verify actual site conditions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.

### **3.2 INSTALLATION**

- 3.2.1 Installation, generally: Install work of this Section in strict accordance with manufacturer's written installation instructions and reviewed Shop Drawings. Supplement manufacturer's installation instructions with additional installation requirements specified in this Section to produce specified work results.
  - 3.2.1.1 Install fire-rated doors according to NFPA 80.
  - 3.2.1.2 Install smoke- and draft-control doors according to NFPA 105.
- 3.2.2 Hardware: Refer to Section 08 71 00, Door Hardware.
- 3.2.3 Factory-Fitted Doors: Align in frames for uniform clearance at each edge. Comply with NFPA 80 for fire-rated doors.

### **3.3 ADJUSTING**

- 3.3.1 Operation: Rehang or replace doors that do not swing or operate freely.



- 3.3.2 Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

**3.4 PROTECTION**

- 3.4.1 Protect flush wood doors from damage, soiling and contaminating substances resulting from construction activities or caused by work of other trades.
- 3.4.2 Where soiling or spills have occurred, remove spills and soiling from adjacent surfaces using cleaning procedures recommended in writing by affected material's manufacturer. Do not use materials or processes that can damage finishes, surfaces, or construction.
- 3.4.3 Promptly replace flush wood doors work damaged during construction that cannot be satisfactorily repaired.

**3.5 CLEANING AND WASTE MANAGEMENT**

- 3.5.1 Cleaning: Maintain clean construction area at the end of each day. When activities of this Section are complete, remove materials, tools, equipment and rubbish.
- 3.5.2 Waste Management and Disposal: sort waste for reuse, recycling, or disposal, as specified. Remove recycling bins and containers from site and dispose of contents at the appropriate waste disposal facilities.

**END OF SECTION**

## **PART 1 GENERAL**

### **1.1 GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: general provisions of Contract, including General and Supplementary Conditions; and requirements of Division 01 Specifications and any additional documents referred to in this Section.
- 1.1.2 Contractor is solely responsible for dividing Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2 SUMMARY**

- 1.2.1 Provide labour, materials, Products, equipment and services to complete sound control door assemblies work specified herein. This includes, but is not necessarily limited, to:
  - 1.2.1.1 Interior sound control wood doors.
  - 1.2.1.2 Interior pressed steel frames.
  - 1.2.1.3 Acoustic seals, thresholds, and astragals.
  - 1.2.1.4 Auxiliary materials required for a complete installation.
- 1.2.2 Related Requirements: Specifications throughout all Divisions of Project shall be read as a whole, and may be directly applicable to this Section. Related requirements provided below are for convenience purposes only:
  - 1.2.2.1 Section 08 71 00 - Door Hardware: Operating hardware not integral to acoustic assembly.
  - 1.2.2.2 Section 08 81 26 - Interior Glass and Glazing: Glazing for sidelites and transoms not factory-installed.
  - 1.2.2.3 Section 09 91 23 - Painting: Field painting of steel frames.

### **1.3 REFERENCES**

- 1.3.1 Reference Standards: Unless otherwise indicated in this Section or Building Code, latest published editions of reference standards as of Project's Bid Closing deadline apply.
- 1.3.2 ANSI/WDMA I.S. 1A: Interior Architectural Wood Flush Doors.
- 1.3.3 ASTM E90: Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- 1.3.4 ASTM E413: Classification for Rating Sound Insulation.
- 1.3.5 ASTM E336: Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings.
- 1.3.6 HMMA 840: Installation and Storage of Hollow Metal Doors and Frames.

1.3.7 NFPA 80: Standard for Fire Doors and Other Opening Protectives.

## **1.4 ADMINISTRATIVE REQUIREMENTS**

- 1.4.1 Pre-installation Meetings: Schedule and hold a pre-installation meeting at Project site at least two (2) weeks before beginning work on this Section to coordinate activities with related Subcontractors.
  - 1.4.1.1 Required Attendees: Installer, Contractor and manufacturer's representative.
  - 1.4.1.2 Agenda: Review installation procedures, coordination with adjacent work, and field quality control requirements.
  - 1.4.1.3 Notification: Where Consultant attendance is required; minimum 72 hour notice is required.
  - 1.4.1.4 Reporting: Record significant discussions, agreements, and disagreements, including required corrective measures and actions.
  - 1.4.1.5 Distribution: Distribute minutes of meeting to each party present and to other parties requiring information not more than 72 hours after meeting.

## **1.5 SUBMITTALS**

- 1.5.1 Submittals, generally: in accordance with Section 01 33 00, Submittal Procedures.
- 1.5.2 Product Data: Submit manufacturer's product data for each component of sound control assembly, including door construction, core details, frame profiles, seal types, and installation instructions.
- 1.5.3 Shop Drawings: Submit Shop Drawings for each opening.
  - 1.5.3.1 Include elevations of each door type, frame profiles, details of acoustic seals, hardware locations and reinforcements, anchor types and spacing, and glazing details.
  - 1.5.3.2 Provide a schedule of doors and frames using same reference numbers as those on Drawings.
- 1.5.4 Environmental and Material Transparency:
  - 1.5.4.1 Embodied Carbon / EPDs: Submit Type III Environmental Product Declaration (EPD) for door and frame assemblies.
  - 1.5.4.2 Material Ingredient Disclosure: Submit Chain-of-Custody Certificates certifying that wood doors comply with Forest Stewardship Council (FSC) certification requirements.
- 1.5.5 Samples: Submit verification samples for following:
  - 1.5.5.1 Wood door finish: 300 mm x 300 mm (12 in x 12 in) sample showing veneer species, cut, and finish.
  - 1.5.5.2 Frame corner: 300 mm x 300 mm (12 in x 12 in) sample showing construction and primer finish.
  - 1.5.5.3 Acoustic seals: 300 mm (12 in) long samples of each type.

## **1.6 CLOSEOUT SUBMITTALS**

- 1.6.1 Operating and Maintenance Data: Submit manufacturer's care and maintenance instructions for all components of assembly.
- 1.6.2 Warranty Documentation: Submit a copy of extended warranty specified in this Section.

## **1.7 QUALITY ASSURANCE**

- 1.7.1 Manufacturer Qualifications: Provide Products for work of this Section by a manufacturer with at least five (5) years of documented experience manufacturing sound control door and frame assemblies of types specified.
- 1.7.2 Installer Qualifications: Engage an entity with documented experience installing work similar in material, design, and extent to that shown, and who is an authorized representative of door assembly manufacturer.
- 1.7.3 Single Source Responsibility: Obtain sound control door assemblies, including doors, frames, seals, thresholds, and integral hardware, from a single manufacturer.

## **1.8 DELIVERY, STORAGE AND HANDLING**

- 1.8.1 Product Requirements, generally: in accordance with Section 01 61 00, Common Product Requirements.
- 1.8.2 Deliver, store and handle materials in accordance with manufacturer's written instructions and HMMA 840. Deliver materials to site in original factory packaging.
- 1.8.3 Weld a minimum of two temporary jamb spreaders per frame prior to shipment.
- 1.8.4 Upon receipt, remove wrappings and inspect for damage.
- 1.8.5 Store doors and frames under cover in a vertical position, spaced with blocking to permit air circulation.
- 1.8.6 Store materials in a climate-controlled area between 10°C and 32°C (50°F and 90°F) and between 25% and 55% relative humidity.

## **1.9 FIELD CONDITIONS**

- 1.9.1 Environmental Restrictions: Do not deliver or install sound control wood doors until building is enclosed, wet work is complete, and HVAC system is operational and will maintain temperature and relative humidity levels equal to occupancy levels for remainder of construction period.

## **1.10 WARRANTY**

- 1.10.1 Extended warranty: Submit for Owner's review and acceptance, manufacturer's extended warranty in which manufacturer commits to repair or replace

components of sound control door assemblies that fail within specified warranty period.

- 1.10.1.1 Failures include: Failure to meet sound rating requirements, faulty seal operation, and wood door warp in excess of 6 mm (1/4 in).
- 1.10.1.2 Warranty Period: Not less than Two (2) years from date of Substantial Performance of work.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURERS**

- 2.1.1 Provided requirements of Contract Documents are satisfied, following manufacturers may supply Products for work this Section:
  - 2.1.1.1 Ambico Limited.
  - 2.1.1.2 Krieger Steel Products Co.
  - 2.1.1.3 Overly Door Company.

### **2.2 REGULATORY REQUIREMENTS**

- 2.2.1 Fire-Rated Door Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings to CAN/ULC S104.

### **2.3 PERFORMANCE / DESIGN CRITERIA**

- 2.3.1 Acoustic Performance: Provide door and frame assemblies tested as a complete unit in accordance with ASTM E90 and classified per ASTM E413 to achieve a minimum STC rating as noted on Drawings and Schedules.
  - 2.3.1.1 Refer to Door Schedule for specific STC ratings for each opening.

### **2.4 WOOD DOORS**

- 2.4.1 General: Flush wood doors, minimum 45 mm (1-3/4 in) thick, fabricated to ANSI/WDMA I.S. 1A; Extra Heavy Duty. Comply with requirements of Section 08 14 16 unless noted otherwise.
- 2.4.2 Core: Manufacturer's standard urea-formaldehyde free, sound-retardant core as required to provide specified STC and fire rating.
- 2.4.3 Facing:
  - 2.4.3.1 Plastic laminate: as noted in Section 09 06 00.

### **2.5 STEEL FRAMES**

- 2.5.1 General: Fully welded, seamless construction with mitred corners. Knocked-down frames are not acceptable.
- 2.5.2 Material: Cold-rolled steel sheet, minimum 1.5 mm (16 gauge) thick.

- 2.5.3 Hardware Reinforcement: Factory-welded reinforcement plates compatible with specified hardware. Provide manufacturer's standard.
- 2.5.4 Finish: Factory-applied, rust-inhibitive primer.
- 2.5.5 Identification: Affix a permanent, inconspicuous nameplate to hinge-side of door and frame indicating manufacturer's name and assembly's STC rating.

## **2.6 DOOR HARDWARE**

- 2.6.1 General: Provide manufacturer's standard, integral sound-control hardware system as tested with assembly to achieve specified STC rating. This includes:
  - 2.6.1.1 Perimeter Seals: factory-fitted to frame.
  - 2.6.1.2 Bottom Seal: Manufacturer's standard type.
  - 2.6.1.3 Threshold: Flat, smooth profile in aluminum.
  - 2.6.1.4 Astragals (for pairs): Acoustic astragal with integral seals.
  - 2.6.1.5 Hinges: Heavy-duty butt type. Provide Cam-lift type for assemblies requiring STC 53 or higher.

## **2.7 FABRICATION**

- 2.7.1 General: Fabricate assemblies to be rigid and free of defects. Factory-fit doors to frames to ensure proper clearances and seal compression.
- 2.7.2 Hardware Preparation: Factory-prepare doors and frames to receive all templated hardware in accordance with Door Hardware Schedule. Reinforce doors for all surface-mounted hardware.

# **PART 3 EXECUTION**

## **3.1 EXAMINATION**

- 3.1.1 Verify openings are plumb, square, and within tolerance before installation. Verify that substrates are prepared and ready to receive assemblies.
- 3.1.2 Notify Consultant in writing of any conditions which would be detrimental to installation. Commencement of work implies acceptance of previously completed work.

## **3.2 INSTALLATION**

- 3.2.1 Installation, generally: Install work of this Section in strict accordance with manufacturer's written installation instructions and reviewed Shop Drawings.
- 3.2.2 For fire-rated door assemblies, comply with NFPA 80.
- 3.2.3 Install frames plumb, level, and square. Brace securely until permanently anchored.

- 3.2.4 Pack space between frame and wall construction solidly with mineral fibre insulation.
- 3.2.5 Fit doors in frames with uniform clearances as recommended by manufacturer to ensure proper operation and seal engagement.
- 3.2.6 Install all acoustic seals, thresholds, and integral hardware. Adjust for a complete and continuous seal around entire perimeter when door is closed.
- 3.2.7 Installation Tolerances: Adjust frames to a maximum deviation from square, alignment, twist, and plumb of +/- 0.8 mm (1/32 in).

### **3.3 FIELD QUALITY CONTROL**

- 3.3.1 Manufacturer's Field Services: Provide a qualified manufacturer's representative to instruct installers on proper installation and adjustment of door assemblies. Upon completion, representative shall inspect installation and verify correct operation.
- 3.3.2 Testing Agency: Engage a qualified independent acoustical testing agency to perform field tests.
- 3.3.3 Testing Services: agency shall test one installed assembly in accordance with ASTM E336. measured field performance (FSTC) shall be within 5 dB of specified laboratory STC rating.
- 3.3.4 Non-Conforming Work: Remove and replace assemblies where test results indicate non-conformance. Additional testing of replaced work will be at Contractor's expense.

### **3.4 ADJUSTING AND CLEANING**

- 3.4.1 Final Adjustments: Adjust all operating hardware and acoustic seals for proper function just before final inspection.
- 3.4.2 Cleaning: Clean soiled surfaces in accordance with manufacturer's instructions. Remove construction debris from work area.

### **3.5 PROTECTION**

- 3.5.1 Protect sound control door assemblies from damage, soiling and contaminating substances resulting from construction activities or caused by work of other trades.
- 3.5.2 Promptly replace work damaged during construction that cannot be satisfactorily repaired.

END OF SECTION

## **PART 1      GENERAL**

### **1.1      GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.
- 1.1.2 Contractor is solely responsible for dividing the Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of the Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2      SUMMARY**

- 1.2.1 Provide labour, materials, products, equipment and services to complete the pass-through windows work specified herein. This includes, but is not necessarily limited, to:
  - 1.2.1.1 Aluminum, medium-duty interior sliding service windows.
  - 1.2.1.2 Auxiliary materials required for a complete installation.
- 1.2.2 Related Requirements
  - 1.2.2.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
  - 1.2.2.2 Specifications throughout all Divisions of the Project Manual are directly applicable to this Section, and this Section is directly applicable to them.

### **1.3      REFERENCES**

- 1.3.1 Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply. Refer to 01 42 00 - References.

### **1.4      DEFINITIONS**

- 1.4.1 As viewed from clerk's side:
  - 1.4.1.1 X = sliding panel,
  - 1.4.1.2 O = fixed panel,

### **1.5      PREINSTALLATION MEETINGS**

- 1.5.1 Pre-installation Meetings: Schedule, and conduct pre-installation meeting at Project Site, in order to coordinate work of this Section, with work of related Subcontractors.
  - 1.5.1.1 Ensure attendance of Subcontractor performing work of this Section and representatives of manufacturers and fabricators involved in, or affected by, installation and coordination with other materials and



installations that have preceded or will follow. Advise Consultant and Owner in advance of scheduled meeting dates.

- 1.5.1.2 Agenda: Review progress of other construction activities and preparations for the particular activity under consideration.
- 1.5.1.3 Record significant discussions, agreements, and disagreements, including required corrective measures and actions.
- 1.5.1.4 Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.

## **1.6 SUBMITTALS**

- 1.6.1 Submittals, generally: in accordance with Section 01 33 00, Submittal Procedures.
- 1.6.2 Product Data: Submit manufacturer's instructions, printed product literature and data sheets for the pass-through windows work and include product characteristics, performance criteria, physical size, finish and limitations.
  - 1.6.2.1 Include recommendations for product application and use.
  - 1.6.2.2 Include test data substantiating that products comply with requirements.
- 1.6.3 Embodied Carbon / Environmental Product Declarations (EPDs): When available, submit product-specific or industry-wide EPDs conforming to ISO 14025 or other recognized environmental Product declaration framework meeting following criteria:
  - 1.6.3.1 EPD Scope: Must cover Cradle-to-Gate (A1 to A3) as a minimum.
  - 1.6.3.2 EPD Impact Categories: Must report Global Warming Potential (GWP) in form of unit of kgCO<sub>2</sub>e/declared unit as a minimum.
  - 1.6.3.3 Product Options: Give preference to Products with compliant documentation when choice is at Contractor's option.
- 1.6.4 Material Ingredient Disclosure: When available, submit documentation disclosing chemical inventory of materials to at least 0.1% (1000ppm) meeting following criteria:
  - 1.6.4.1 Standard: Health Product Declaration (HPD) Open Standard, Cradle to Cradle v2 (Basic level) or Cradle to Cradle v3 (Bronze level), International Living Future Institute (ILFI) Declare, or other approved material ingredient declaration framework.
  - 1.6.4.2 Product Options: Give preference to Products with compliant documentation when choice is at Contractor's option.
- 1.6.5 Shop Drawings: Submit Shop Drawings 01 for the following:
  - 1.6.5.1 Include plans, elevations, sections, hardware, accessories, operational clearances, and details of installation, including anchor, and sealant installation.

## **1.7 QUALITY ASSURANCE**

- 1.7.1 Manufacturer Qualifications: A manufacturer capable of fabricating pass-through windows that meet or exceed performance requirements indicated.

**1.8 DELIVERY, STORAGE, AND HANDLING**

- 1.8.1 Deliver windows crated to provide protection during transit and job storage
- 1.8.2 Inspect windows upon delivery for damage. Remove and replace damaged parts that cannot be satisfactorily repaired.
- 1.8.3 Store windows at building site under cover in dry location.

**1.9 PROJECT CONDITIONS**

- 1.9.1 Field measurements: Check opening by accurate field measurement before fabrication. Show recorded measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of work.

**PART 2 PRODUCTS****2.1 MANUFACTURERS**

- 2.1.1 Products from the following manufacturers may be acceptable for inclusion into The Work, provided they meet requirements of Contract Documents.
  - 2.1.1.1 C.R. Laurence Co.
  - 2.1.1.2 Easi-Serv

**2.2 COMPONENTS**

- 2.2.1 Frames: ASTM B 221M (ASTM B 221), Alloy 6063-T5 or alloy and temper required to suit structural and finish requirements, not less than 1.6 mm (0.062 inch) thick. Design window to roll on top-hung ball bearing rollers. Provide catch locks with interior windows.
  - 2.2.1.1 Finish: clear anodized.
- 2.2.2 Fasteners: Aluminum, nonmagnetic stainless-steel or other noncorrosive metal fasteners compatible with frames, stops, panels, reinforcement plates, hardware, anchors, and other items being fastened.
- 2.2.3 Glazing: ASTM C1048 Type I; Quality-Q3; Class I (clear); Kind FT or equivalent to CAN/CGSB-12.1 unless otherwise indicated. Perform heat strengthening using horizontal tong free method; surface compression not less than 69 MPa (10,000 psi). Glazing must comply with testing requirements in 16 CFR 1201 for Category II materials.
- 2.2.4 Glazing Gaskets: Manufacturer's standard extruded or molded plastic, to accommodate glazing thickness indicated on Drawings and Schedules.
- 2.2.5 Locking: Keyed lock, full bottom track, screen. Coordinate with Section 08 71 00.
- 2.2.6 Acceptable Product: "Daisy - Sliding; Model - D1041AXX3648" by C.R. Laurence Co., Inc or approved equivalent.

**2.3 FABRICATION**

- 2.3.1 Machine jambs and prepare for hardware, with concealed reinforcement plates, drilled and tapped as required, and fastened within frame with concealed screws.

- 2.3.2 Provide concealed corner reinforcements and alignment clips for accurately fitted hairline joints at butted or mitered connections.
- 2.3.3 Fabricate frames for glazing with removable stops to allow glazing replacement without dismantling frame.
- 2.3.4 Fabricate all components to allow secure installation without exposed fasteners.

## **2.4 ALUMINUM FINISHES**

- 2.4.1 General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- 2.4.2 Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- 2.4.3 Class II, Clear Anodic Finish: AA-M12C22A31 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, clear coating 0.010 mm or thicker) complying with AAMA 611.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- 3.1.1 Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, supports, and other conditions affecting performance of the Work.

### **3.2 INSTALLATION**

- 3.2.1 Install window in accordance with manufacturer's printed instructions and recommendations.
- 3.2.2 Install frames plumb and square, securely anchored to substrates.

### **3.3 CLEANING**

- 3.3.1 Clean frame and glazing surfaces after installation, complying with requirements contained in the manufacturer's instructions. Remove excess glazing sealant compounds, dirt or other substances.
- 3.3.2 Touch up marred frame surfaces so touchup is not visible from a distance of 1220 mm (48 inches). Remove and replace frames with damaged finish that cannot be satisfactorily repaired.

### **3.4 PROTECTION**

- 3.4.1 Protect installed materials as required throughout the remainder of construction period to ensure that windows do not incur damage or deterioration.

**END OF SECTION**

## **PART 1      GENERAL**

### **1.1      GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.
- 1.1.2 Contractor is solely responsible for dividing the Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of the Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2      SUMMARY**

- 1.2.1 Provide labour, materials, Products, equipment and services to complete the door hardware work specified herein. This includes, but is not necessarily limited, to:
  - 1.2.1.1 Swinging doors.
  - 1.2.1.2 Sliding doors.
  - 1.2.1.3 Electrified door hardware.
  - 1.2.1.4 Temporary locking cylinders and keys for construction use.
  - 1.2.1.5 Auxiliary materials required for a complete installation.
- 1.2.2 Related Requirements: Specifications throughout all Divisions of the Project shall be read as a whole, and may be directly applicable to this Section. Related requirements provided below are for convenience purposes only:
  - 1.2.2.1 Section 07 92 00 – Joint Sealants
  - 1.2.2.2 Section 08 11 13 – Hollow Metal Doors and Frames
  - 1.2.2.3 Section 08 14 16 – Flush Wood Doors
  - 1.2.2.4 Division 26, Electrical.
  - 1.2.2.5 Division 28, Electronic Safety and Security.

### **1.3      REFERENCES**

- 1.3.1 Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply.
- 1.3.2 Builders Hardware Manufacturers Association (BHMA)
  - 1.3.2.1 BHMA A156.1 – Butts and Hinges
  - 1.3.2.2 BHMA A156.13 – Mortise Locks
  - 1.3.2.3 BHMA A156.14 – Sliding and Folding Door Hardware
  - 1.3.2.4 BHMA A156.15 - Release Devices – Closer Holder, Electromagnetic, and Electromechanical
  - 1.3.2.5 BHMA A156.16 - Auxiliary Hardware

- 1.3.2.6 BHMA A156.17 - Self Closing Hinges & Pivots
- 1.3.2.7 BHMA A156.18 - Materials and Finishes
- 1.3.2.8 BHMA A156.2 – Locks and Latches
- 1.3.2.9 BHMA A156.21 – Thresholds
- 1.3.2.10 BHMA A156.22 – Gasketing
- 1.3.2.11 BHMA A156.23 - Electromagnetic Locks
- 1.3.2.12 BHMA A156.24 - Delayed Egress Locking Systems
- 1.3.2.13 BHMA A156.25 - Electrified Locking Systems
- 1.3.2.14 BHMA A156.26 - Continuous Hinges
- 1.3.2.15 BHMA A156.28 - Recommended Practices For Mechanical Keying Systems
- 1.3.2.16 BHMA A156.29 - Exit Locks, Exit Alarms, Alarms for Exit Devices
- 1.3.2.17 BHMA A156.3 - Exit Devices
- 1.3.2.18 BHMA A156.30 - High Security Cylinders
- 1.3.2.19 BHMA A156.31 - Electric Strikes and Frame Mounted Actuators
- 1.3.2.20 BHMA A156.34 - Bored Locks and Mortise Locks with Ligature Resistant Trim
- 1.3.2.21 BHMA A156.36 - Auxiliary Hardware
- 1.3.2.22 BHMA A156.4 - Door Closers and Pivots
- 1.3.2.23 BHMA A156.5 - Cylinders and Input Devices for Locks
- 1.3.2.24 BHMA A156.6 - Architectural Door Trim
- 1.3.2.25 BHMA A156.8 - Door Controls - Overhead Stops & Holders
- 1.3.3 Underwriters Laboratory Canada (ULC)
  - 1.3.3.1 CAN/ULC S104 - Standard Method for Fire Tests of Door Assemblies
- 1.3.4 Canadian Standards Association (CSA)
  - 1.3.4.1 CAN/CSA B651 – Accessible Design for the Built Environment
  - 1.3.4.2 CSA C22.1 - Canadian Electrical Code, Part I (25th Edition), Safety Standard for Electrical Installations
- 1.3.5 Hollow Metal Manufacturers Association (HMMA)
  - 1.3.5.1 HMMA 831 – Hardware Locations For Hollow Metal Doors and Frames
- 1.3.6 International Organization for Standardization (ISO)
  - 1.3.6.1 ISO 14025 - Environmental labels and declarations — Type III environmental declarations — Principles and procedures
- 1.3.7 National Fire Protection Association (NFPA)
  - 1.3.7.1 NFPA 80 - Standard for Fire Doors and Other Opening Protectives
- 1.3.8 Steel Door Institute (SDI)
  - 1.3.8.1 SDI A250.8 – Specification for Steel Doors and Frames

#### **1.4 ADMINISTRATIVE REQUIREMENTS**

- 1.4.1 Pre-installation Meetings: Schedule and hold a pre-installation meeting at the Project site before beginning work on this Section to coordinate activities with related Subcontractors.
  - 1.4.1.1 Notification: Where Consultant attendance is required; minimum 72 hour notice is required.
  - 1.4.1.2 Reporting: Record significant discussions, agreements, and disagreements, including required corrective measures and actions.
  - 1.4.1.3 Distribution: Distribute minutes of the meeting to each party present and to other parties requiring information not more than 72 hours after meeting.
- 1.4.2 Keying Meeting: Conduct meeting at Project site in accordance with Division 01 to discuss keying requirements for Project. In addition to Owner, Contractor, and Consultant, participants shall also include Installer's Architectural Hardware Consultant and Security Consultant. Incorporate keying conference decisions into final hardware schedule after reviewing door hardware keying system including, but not limited to, the following:
  - 1.4.2.1 Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
  - 1.4.2.2 Preliminary key system schematic diagram.
  - 1.4.2.3 Requirements for key control system.
  - 1.4.2.4 Requirements for access control.
  - 1.4.2.5 Address for delivery of keys.
  - 1.4.2.6 Other pertinent requirements.

#### **1.5 SUBMITTALS**

- 1.5.1 Submittals, generally: in accordance with Section 01 33 00, Submittal Procedures.
- 1.5.2 Product Data: Submit manufacturer's product characteristics, catalogue cuts, installation instructions and other relevant information for each material and product used for door hardware work specified in this Section.
  - 1.5.2.1 Hardware List: Include manufacturer, catalogue number, material, function, finish, and item location in the Work.
- 1.5.3 Shop Drawings: Submit Shop Drawings indicating material layouts, details of construction, connections, and relationship with adjacent construction. As a minimum indicate following:
  - 1.5.3.1 Submit Shop Drawings in schedule form, indicating manufacturers' names, Product descriptions, makes, models, materials, finishes, functions, location of each item, complete hardware schedule and other pertinent information. Repeat hardware item numbers used in Door Hardware Schedule. Include list of abbreviations and finish symbols and their meaning. Include manufacturer's cut sheets for each hardware item.
  - 1.5.3.2 Include diagrams for power, signal, and control wiring.

- 1.5.3.3 Include details of interface of electrified door hardware and building safety and security systems.
- 1.5.4 Environmental and Material Transparency:
  - 1.5.4.1 Embodied Carbon / EPDs: When available, Submit EPDs conforming to ISO 14025 or equivalent standard; prioritize products with such documentation when choices are at Contractor's option.
  - 1.5.4.2 Material Ingredient Disclosure: When available, submit documentation identifying chemical inventories of materials to at least 0.1% (1000ppm) in accordance with HPD Open Standard, Cradle to Cradle (Basic v2/Bronze v3), ILFI Declare, or equivalent standard; products with such documentation when choices are at Contractor's option.
- 1.5.5 Samples: When requested by Consultant, deliver physical samples of approved finish hardware items to Consultant. Identify each sample by label indicating applicable Specification paragraph or line number, brand name and number, finish and hardware package number.
  - 1.5.5.1 Consultant will retain samples until completion of Project, at which time, samples will be returned to Supplier.

## **1.6 CLOSEOUT SUBMITTALS**

- 1.6.1 Operating and Maintenance Data: Submit care and maintenance instructions for door hardware to be included in building operation and maintenance manual.
- 1.6.2 Spare Tools: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.
- 1.6.3 Warranty Documentation: Submit copy of extended warranties specified in this Section.

## **1.7 QUALITY ASSURANCE**

- 1.7.1 Engage a hardware specialist certified as an Architectural Hardware Consultant to provide the following services:
  - 1.7.1.1 Consult with Contractor, Consultant, and Owner about door hardware and keying.
  - 1.7.1.2 Examine the Drawings, Hardware Schedules, and shop drawings to determine final dimensions, sizes, and quantity of the hardware items required, ensure proper operation and size of hardware listed, and make adjustments to noncompliant hardware.
- 1.7.2 Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and of an Architectural Hardware Consultant who is available during the course of the Work to consult Contractor, Consultant, and Owner about door hardware and keying.
  - 1.7.2.1 Scheduling Responsibility: Preparation of door hardware and hardware schedule.
  - 1.7.2.2 Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering

analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

- 1.7.3 Architectural Hardware Consultant Qualifications: A person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project.
- 1.7.4 Single Source Responsibility: Obtain primary materials for this Section from a single source by a single manufacturer, and secondary materials from sources recommended by manufacturers of primary materials.

## **1.8 DELIVERY, STORAGE AND HANDLING**

- 1.8.1 Product Requirements, generally: in accordance with Section 01 61 00, Common Product Requirements.
- 1.8.2 Packaging and marking: Individually package each unit of finish hardware, complete with proper fastenings and appurtenances, clearly marked on outside to indicate contents and specific locations in the Work.
  - 1.8.2.1 Replacements: In the event of damage, immediately make all repairs and replacements necessary to approval of Consultant and at no additional cost to Owner.
  - 1.8.2.2 Stockpile all items sufficiently in advance to ensure their delivery to the site in a timely manner to ensure orderly progress of Work.

## **1.9 WARRANTY**

- 1.9.1 Extended warranty: Submit for Owner's review and acceptance, manufacturer's extended warranty in which manufacturer commits to repair or replace components of door hardware that fail within specified warranty period. Manufacturer's extended warranty is in addition to, and does not supersede, any other rights that Owner may have under Contract Documents.
  - 1.9.1.1 Warranty Period:
    - .1 Locks, latches and cylinders: 2 years from Substantial Performance of the Work.
    - .2 Electromagnetic and Delayed-Egress Locks: 5 years from date of Substantial Performance of the Work.
    - .3 Exit Devices: 2 years from date of Substantial Performance of the Work.
    - .4 Closers: 10 years from date of Substantial Performance of the Work.

## **PART 2 PRODUCTS**

### **2.1 PRODUCTS AND MANUFACTURERS**

- 2.1.1 Refer to Door and Hardware Schedule on the Drawings for approved products and manufacturers.



## **2.2 REGULATORY REQUIREMENTS**

- 2.2.1 Hardware for doors in fire separations and exit doors must be certified by a Canadian Certification Organization accredited by Standards Council of Canada.
- 2.2.2 Fire-Rated Door Assemblies: Where fire-rated doors are indicated, provide door hardware complying with NFPA 80 that is listed and labelled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to CAN/ULC S104.
- 2.2.3 Electrified Door Hardware: Listed and labelled as defined in CSA C22.1, by a qualified testing agency, and marked for intended location and application.
- 2.2.4 Accessibility Requirements: For door hardware on doors in an accessible route, comply with Ontario Building Code and CAN/CSA B651.

## **2.3 HARDWARE STANDARDS**

- 2.3.1 The minimum criteria for hardware specified in this section are to be according to the following table unless specified otherwise. Unless otherwise indicated, provide Grade 1 hardware in accordance with BHMA A156 Series standards.

<b>Item</b>	<b>BHMA Standard</b>
<b>Hinges</b>	BHMA A156.1
<b>Self-Closing Hinges and Pivots</b>	BHMA A156.17
<b>Centre-Hung and Offset Pivots</b>	BHMA A156.4
<b>Continuous Hinges</b>	BHMA A156.26
<b>Pin-and-Barrel Type Hinges</b>	BHMA A156.26
<b>Mechanical Locks and Latches</b>	Bored Locks: BHMA A156.2 Mortise Locks: BHMA A156.13
<b>Auxiliary Locks</b>	BHMA A156.36
<b>Electric Strikes</b>	BHMA A156.31
<b>Electromagnetic Locks</b>	BHMA A156.23 BHMA A156.24 (for delayed egress)
<b>Electromechanical Locks</b>	BHMA A156.25
<b>Self-Contained Electronic Locks</b>	BHMA A156.25
<b>Exit Locks and Alarms</b>	BHMA A156.29, Grade 1
<b>Surface Bolts</b>	BHMA A156.16
<b>Manual Flush Bolts</b>	BHMA A156.16
<b>Automatic and Self-Latching Flush Bolts</b>	BHMA A156.3, Types 25 and 27
<b>Exit Devices and Auxiliary Items</b>	BHMA A156.3
<b>Lock Cylinders</b>	Standard Cylinders: BHMA A156.5 High-Security Cylinders: BHMA A156.30
<b>Keying System</b>	BHMA A156.28
<b>Key Control System</b>	BHMA A156.28
<b>Operating Trim</b>	BHMA A156.6
<b>Accessories for Pairs of Doors</b>	Coordinators: BHMA A156.3 Carry-Open Bars: BHMA A156.3 Astragals: BHMA A156.22
<b>Surface and Concealed Door Closers</b>	BHMA A156.4

<b>Closer Holder Release Devices</b>	BHMA A156.15, Grade 1
<b>Mechanical Stops and Holders</b>	BHMA A156.16
<b>Electromagnetic Stops and Holders</b>	BHMA A156.15, Grade 1
<b>Overhead Stops and Holders</b>	BHMA A156.8
<b>Door Gasketing</b>	BHMA A156.22
<b>Thresholds</b>	BHMA A156.21
<b>Sliding and Folding Door Hardware</b>	BHMA A156.14
<b>Metal Protective Trim Units</b>	BHMA A156.6
<b>Auxiliary Door Hardware</b>	BHMA A156.16
<b>Auxiliary Electrified Door Hardware</b>	BHMA A156.34 (if referenced)
<b>Finishes</b>	BHMA A156.18

## **2.4 SEALING / WEATHERSTRIPPING**

- 2.4.1 Install weatherstripping to seal door perimeters, with non-ferrous screws. Adjust for closers and ensure head integrity.
- 2.4.2 Perimeter Seals:
  - 2.4.2.1 Provide seals to cover gaps between the door, frame, and floor to block weather, sound, and smoke.
  - 2.4.2.2 Use closed-cell neoprene for frame gaskets.
  - 2.4.2.3 For aluminum frames, include felt inserts as supplied by frame manufacturers.
  - 2.4.2.4 Where carpet flooring exists, provide drop inserts as required.
- 2.4.3 Threshold Installation:
  - 2.4.3.1 Install thresholds to ensure complete contact with the door bottom.
  - 2.4.3.2 For exterior doors, provide thermally broken thresholds.
- 2.4.4 High-Traffic Doors:
  - 2.4.4.1 Equip exterior, high-traffic doors with heavy-duty solid jamb and head seals.
  - 2.4.4.2 Use fire-rated seals on fire doors where applicable.
- 2.4.5 Additional Seal Requirements: For STC-rated doors, install heavy-duty adjustable seals, with silicon stop-mounted seals to block sound and light.

## **2.5 KICKPLATES/ARMOR PLATES**

- 2.5.1 Provide brushed stainless steel Type 304, minimum 1.214 mm (18 gauge) push plates, kickplates, armour plates, door edges, and channels free of rough or sharp edges unless otherwise specified. Adjust for fire rating requirements for specific armour plates and door channels.
- 2.5.2 Install kickplates and armour plates using 3M double-sided tape, unless otherwise indicated.

## **2.6 KEYING**

- 2.6.1 Provide construction keying for all locks.
- 2.6.2 Keying System: Factory registered, complying with guidelines in BHMA A156.28, appendix. Provide one extra key blank for each lock. Incorporate decisions made in keying meetings.
- 2.6.3 Key locks according to requirements indicated in Finish Hardware Schedule.

## **2.7 AUXILIARY MATERIALS**

- 2.7.1 Fasteners:
  - 2.7.1.1 Supply all finish hardware with screws, bolts, and other fasteners of appropriate size and type to ensure secure installation for heavy-duty use.
  - 2.7.1.2 Provide expansion shields, toggle bolts, and other anchors as needed, based on substrate material and manufacturer recommendations.
  - 2.7.1.3 Exposed Screws: Use Phillips or Robertson head screws for exposed hardware fasteners unless noted otherwise.
  - 2.7.1.4 Ensure fasteners match material and finish of associated hardware for visual harmony and durability. Coordinate finishes across all items provided under this section to achieve a uniform and acceptable finish throughout.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- 3.1.1 Verify actual site conditions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.
- 3.1.2 Verification: Confirm sizes for kickplates and thresholds before ordering. Do not use wall stops on gypsum board, demountable or moveable partitions.
- 3.1.3 Supply metal door and frame manufacturers with complete instructions and templates for preparation of their Work to receive hardware.
- 3.1.4 Fully adjust all non-sized or universal door closers in strict accordance with the manufacturer's printed instructions for spring power closing speed, latching speed and backcheck at the time of installation.
- 3.1.5 The Supplier shall thoroughly check the door schedules and Working Drawings to ensure that hardware listed can be used as specified in accordance with building codes and function. Bring to attention of the Consultant any errors or omissions therein.
- 3.1.6 Doors shown on Drawings and omitted from the schedules shall be included on the detailed finish hardware list.

**3.2 INSTALLATION**

- 3.2.1 Installation, generally: Install work of this Section in strict accordance with manufacturer's written installation instructions and reviewed Shop Drawings. Supplement manufacturer's installation instructions with additional installation requirements specified in this Section to produce specified work results.
- 3.2.2 Hardware Location: Mount door hardware at heights as indicated on Drawings or according to the following standards unless otherwise specified or required by regulations:
  - 3.2.2.1 Standard Steel Doors and Frames: ANSI/SDI A250.8.
  - 3.2.2.2 Custom Steel Doors and Frames: HMMA 831.
  - 3.2.2.3 Wood Doors: DHI's "Recommended Locations for Architectural Hardware for Wood Flush Doors."
- 3.2.3 Hardware locations are to pre-determined standard industry recommendations. On custom doors, mount hardware across intermediate rail to meet architectural design considerations.
- 3.2.4 When installation requires cutting or fitting hardware on surfaces that will later be painted or finished, coordinate removal, storage, and reinstallation with finishing work.
- 3.2.5 Postpone installation of surface-mounted items until substrate finishes are complete.
- 3.2.6 Hinges: Install hinge types and quantities as indicated in the hardware schedule, ensuring no fewer than the manufacturer's recommended quantity or one hinge per 750 mm (30 inches) of door height, whichever is more stringent, unless spring hinges or pivots provide equivalent support.
- 3.2.7 Boxed Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings. Confirm locations with Consultant. Provide required number of power supplies needed to serve doors with electrified hardware.
- 3.2.8 Thresholds: Set thresholds for exterior doors and other indicated doors in a full bed of sealant as specified in Section 07 92 00.
- 3.2.9 Sealing and Gasketing:
  - 3.2.9.1 Perimeter Gasketing: Apply gasketing to the head and jamb to form a seal between door and frame. Do not notch gasketing to accommodate other surface-applied hardware.
  - 3.2.9.2 Meeting Stile Gasketing: Attach gasketing to meeting stiles to form a complete seal when doors are closed.
  - 3.2.9.3 Door Bottoms: Install door bottoms to create a seal with the threshold when the door is closed.
- 3.2.10 Door closers and holders: Install door closers in such a manner that door opening is unaffected and that maximum swing is permitted. Prior to installing closer to the door, it is the responsibility of the installer to:
  - 3.2.10.1 Index the arm attachment so as to properly position the arm to the closer.

- 3.2.10.2 Adjust the back check positioning valve in order to maintain an effective backcheck range.

### **3.3 KEY SECURITY**

- 3.3.1 Install construction cores to secure areas during construction.
- 3.3.2 Supply permanent cores to Owner for installation.
- 3.3.3 Replace construction cores with permanent cores as indicated in hardware schedule.

### **3.4 ADJUSTING**

- 3.4.1 Adjust each door hardware component to ensure proper operation.
- 3.4.2 Replace components that cannot be adjusted for proper function.
- 3.4.3 Calibrate door control devices to accommodate final operation of heating and ventilation equipment and to meet accessibility requirements.

### **3.5 FIELD QUALITY CONTROL**

- 3.5.1 Site Inspections by Hardware Supplier's Representative
  - 3.5.1.1 Site Visits and Reporting: Require hardware supplier's representative to conduct site visits. After each visit, representative must submit a written report detailing the following:
    - .1 Storage conditions,
    - .2 Installation details,
    - .3 Date of visit, and
    - .4 Name of hardware supplier's representative.
  - 3.5.1.2 Qualifications of Representative: Ensure hardware supplier's representative conducting site inspections is an Architectural Hardware Consultant must notify Contractor and Consultant of any issues related to improper installation, required adjustments, incorrect hardware type, or defective hardware.
- 3.5.2 Final Inspection and Certification
  - 3.5.2.1 Pre-Completion Inspection: Before the Work is completed and after hardware installation, the hardware supplier's representative must:
    - .1 Inspect hardware installation, and
    - .2 Submit certificate to the Consultant verifying that:
      - .1 A final inspection has been conducted,
      - .2 All hardware is of the correct type, properly installed, and adjusted,
      - .3 Hardware is in good working order and condition,
      - .4 Installation conforms to the Contract requirements.

### **3.6 PROTECTION**

- 3.6.1 Protect door hardware from damage, soiling and contaminating substances resulting from construction activities or caused by work of other trades.

- 3.6.2 Promptly replace door hardware work damaged during construction that cannot be satisfactorily repaired.

### **3.7 CLEANING AND WASTE MANAGEMENT**

- 3.7.1 Cleaning: Maintain clean construction area at the end of each day. When activities of this Section are complete, remove materials, tools, equipment and rubbish.
- 3.7.2 Waste Management and Disposal: sort waste for reuse, recycling, or disposal, as specified. Remove recycling bins and containers from site and dispose of contents at the appropriate waste disposal facilities.

### **3.8 HARDWARE SCHEDULE**

- 3.8.1 The Finish Hardware Schedule is appended to and forms part of this Section.

**END OF SECTION**

# DOOR HARDWARE

08 71 00

PROJECT:   
Sunnybrook K2E & K3E RENO  
Toronto, ON

ARCHITECT: **NORR**  
175 Bloor Street East  
North Tower, 15th Floor  
Toronto, Ont

Prepared By: Alex Bekmansourov  
Date: June 26, 2025  
Revised: August 12, 2025

## Architectural Hardware Finishes

	Steel	Stainless Steel	Brass/Bronze	Aluminum	Paint/Powder Coat	US/CAN
Clear Anodized				628	689	US28
Satin Nickel	646		619	670		US15
Polished Nickel	645		618	669		US14
Satin Stainless Steel		630				US32D
Polished Stainless Steel		629				US32
Satin Chrome	652		626	702		US26D
Polished Chrome	651		625	672		US26
Satin Brass	633		606	667	678	US4
Polished Brass	632		605	666	677	US5
Satin Bronze	639		612	668	680	US10
Oil Rubbed Bronze	640		613	703	695	US10B
Flat Black / Anodized Black	631		622	671	693	US19

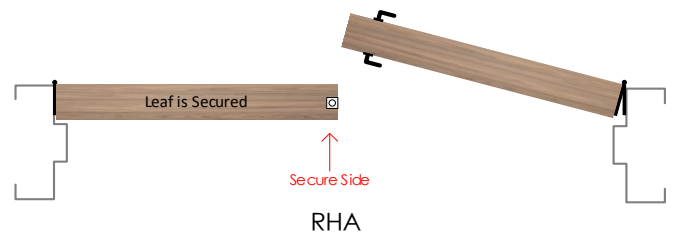
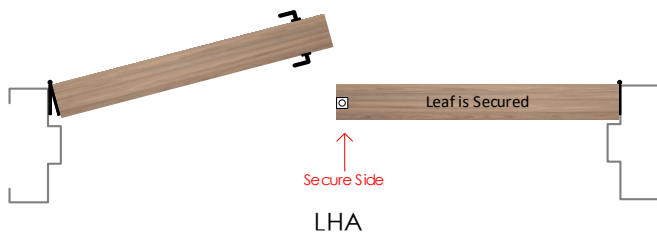
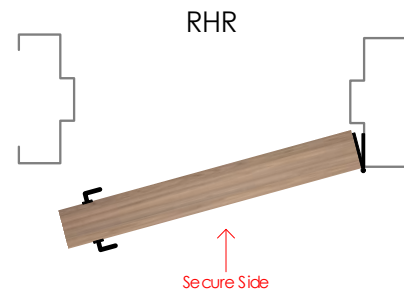
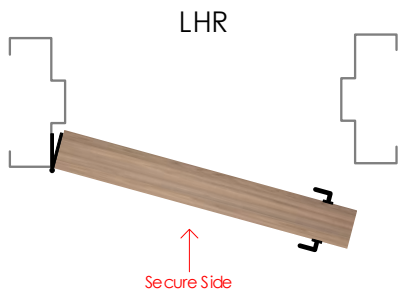
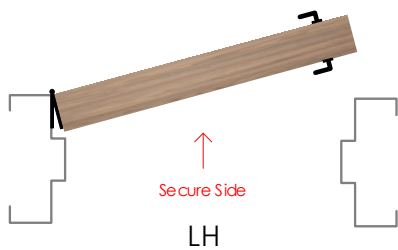


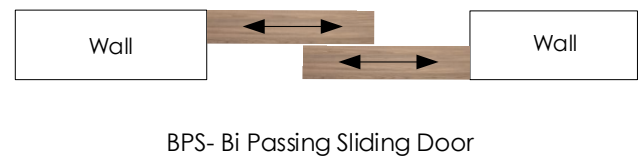
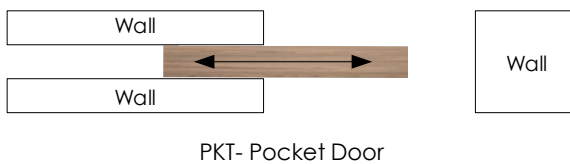
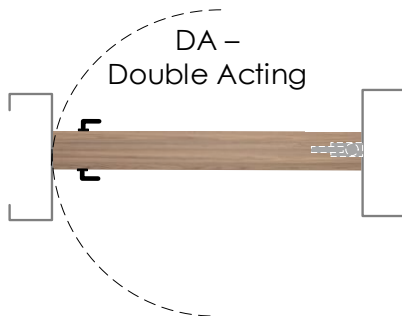
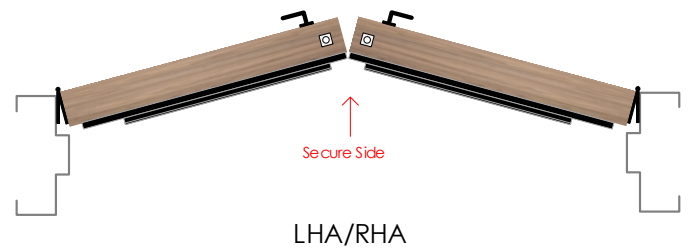
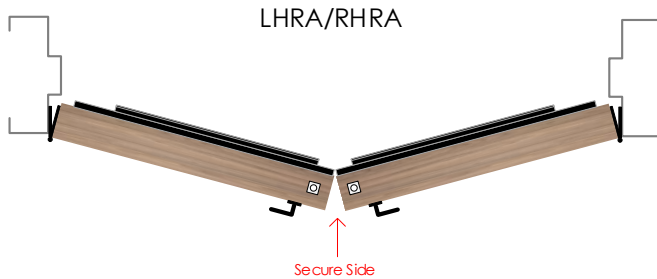
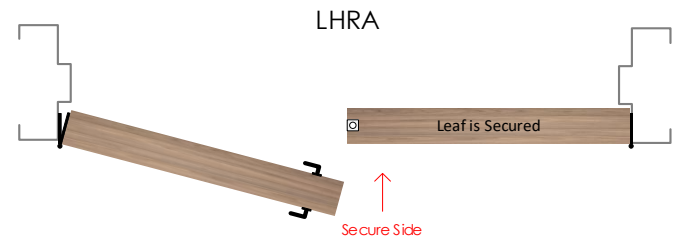
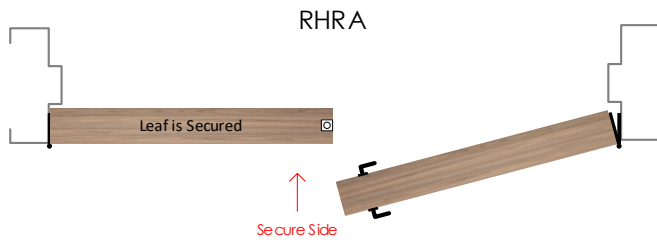
## Door Handing's

### Abbreviations

RH = Right Hand	RHA = Right Hand Active	SS = Single Slider
LH = Left Hand	LHA = Left Hand Active	BP = Bi-Parting Slider
RHR = Right Hand Reverse	RHA/LHA = Right & Left Hands Active	BF = Bi-Folding Slider
LHR = Left Hand Reverse	RHRA/LHRA = Right & Left Hand Reverse Active	TS = Telescopic Slider
RHRA = Right Hand Reverse Active	DA = Double Acting	PKT = Pocket Slider
LHRA = Left Hand Reverse Active	DE = Double Egress	

**NOTE:** The handing of a swing door is determined by placing yourself on the secured or keyed side of the door.





## Products & Alternatives

**NOTE:** Only those products / brands listed here are acceptable and should be used to form a bid price. No unsolicited products will be considered. If acceptable alternates are listed here those too can be used to form a bid price provided, they are exactly the same as the specified item. If using an alternate product to form a price it is the bidder's responsibility to ensure that product is identical in every way to the specified item. If no alternates are listed, no alternate products are acceptable.

Product Type	Product#	Manufacturer	Alternate Manufacturer 1	Alternate Manufacturer 2
Continuous Hinge	SL24HD	Select		
Power Transfer	EPT-10	Von Duprin		
Electric Strike	1006CS	HES		
Lockset	L9000 series	Schlage		
Door Closer	4040XP	LCN		
Auto Door Operator	SW200i	Besam		
Actuator	CM-7536SS/4	Camden		
Overhead Stop	100 series	Glynn Johnson		
Kick / Armour Plate	K10	Standard Metal		
Frame Guard	K51	Standard Metal		
Smoke / Sound Seal	W-66	KN Crowder		
Door Sweep	W-24S	KN Crowder		
Door Contact	DPS	Securitron		
Door Sensor	OA-Edge1T	Optex		

## Symbols



- Door has a fire rating and all associated hardware must have a fire label to suit. Must comply with local requirements.



- Door is automatic and is equipped with an auto operator. Door must meet local barrier free codes



- Door has an electrical requirement and requires power to be brought to the appropriate location above the door or to the latch, for either security or barrier free applications. Refer to security & electrical drawings for further information.



- Door requires security card access. Refer to security / electrical drawings for further information.

## Abbreviations

### Door:

HMD = Hollow Metal Door  
IHMD = Insulated Hollow Metal Door  
ALD = Aluminum Door  
SSD = Stainless Steel Door  
ISSD = Insulated Stainless Steel Frame  
STL = Steel Door  
IC-ALD = Insulated Clad Aluminum Door  
SCWD = Solid Core Wood Door  
HCWD = Hollow Core Wood Door  
FGD = Frameless Glass Door  
FRP = Fiberglass Reinforced Plastic Door  
OHD = Overhead Door

### Frame:

HMF = Hollow Metal Frame  
ALF = Aluminum Frame  
Cased Open HMF = Cased Open Hollow Metal Frame  
SSF - Stainless Steel Frame  
STL = Steel Frame  
WDF = Wood Frame  
Cased Open WDF = Cased Open Wood Frame  
Cased Open Drywall = Cased Open Drywall

### Fire Ratings:

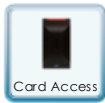
0 HR – Zero Hour Fire Rating / Smoke Barrier  
20 MIN – 20 Minute Fire Rating  
¾ HR – 45 Minute Fire rating  
1 ½ HR – 90 Minute Fire Rating  
2 HR – 120 Minute Fire Rating  
3 HR – 180 Minute Fire Rating

## Disclaimer

### Weblinks:

Weblinks do change from time to time as manufacturers move around their websites, please inform us if you have a none functioning weblink.









## HARDWARE SCHEDULE



Heading# 1

Opening Information					
Opening Type:	Single	Opening Size:	874 x 2135 x 45	STC Rating	None
Door Material:	SCWD	Frame Material:	HMF	Fire Rating	None

1	Total Openings							
1	Door#	K2E01	Location:	CORRIDOR 02	To	LOCKER / COAT ROOM K2E 01	Handing:	LH

By Hardware Supplier					
1	Continuous Hinge	SL24HD x 2110 x TIPIT	628 / US28 / Clear Anodized	Select	
1	Mortise Storeroom Lockset	LV9080BDC x 03B x 630	630 / US32D / Satin Stainless Steel	Schlage	
1	Electric Strike	1500C x LMB	630 / US32D / Satin Stainless Steel	HES	
1	Closer	4041XP– REG MOUNT	689 / US28 / Painted Aluminum	LCN	
1	Edge Guard	K38 x 2135 (cutout for latch)	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Mounting Plate	4040XP-18TJ	689 / US28 / Painted Aluminum	LCN	
1	Overhead Stop	104S	630 / US32D / Satin Stainless Steel	Glynn Johnson	
2	Half Frame Guard	K51 x 1219	630 / US32D / Satin Stainless Steel	Standard Metal	
By Security Supplier					
1	Card Reader	By Security Supplier – To Suit Building System			
1	Door Contact	By Security Supplier			
1	Request to Exit Sensor	By Security Supplier			
1	Access Controller	By Security Supplier			
1	Power Supply	By Security Supplier – Powered by Security Panel			
By Owner					
1	Permanent Core	Best Coremax SFIC by Sunnybrook Locksmith		Best	

## Notes:

- Final commissioning of all access control items, such as but not limited to electric strikes, Rex sensors, Door contacts, Electrified

Panics, Relays & Maglocks is the responsibility of the security provider

-----End of Heading-----



Heading#

2

#### Opening Information







<b>Opening Type:</b>	Single	<b>Opening Size:</b>	1219 x 2135 x 45	<b>STC Rating</b>	None
<b>Door Material:</b>	SCWD	<b>Frame Material:</b>	HMF	<b>Fire Rating</b>	0 HR

8	Total Openings							
1	<b>Door#</b>	K2E04	<b>Location:</b>	CORRIDOR 02	To	PATIENT 3 - BED SUITE K2E 04	<b>Handing:</b>	RH
1	<b>Door#</b>	K2E14	<b>Location:</b>	CORRIDOR 02	To	PATIENT 3 - BED SUITE K2E 14	<b>Handing:</b>	LH
1	<b>Door#</b>	K2E16	<b>Location:</b>	CORRIDOR 02	To	PATIENT 3 - BED SUITE K2E 16	<b>Handing:</b>	RH
1	<b>Door#</b>	K2E21	<b>Location:</b>	CORRIDOR 01	To	PATIENT 3 - BED SUITE K2E 21	<b>Handing:</b>	LH
1	<b>Door#</b>	K2E23	<b>Location:</b>	CORRIDOR 01	To	PATIENT 3 - BED SUITE K2E 23	<b>Handing:</b>	RH
1	<b>Door#</b>	K2E33	<b>Location:</b>	CORRIDOR 01	To	PATIENT 3 - BED SUITE K2E 33	<b>Handing:</b>	LH
1	<b>Door#</b>	K2E35	<b>Location:</b>	CORRIDOR 01	To	PATIENT 3 - BED SUITE K2E 33	<b>Handing:</b>	RH
1	<b>Door#</b>	K2E02	<b>Location:</b>	CORRIDOR 02	To	PATIENT 3 - BED SUITE K2E 02	<b>Handing:</b>	LH

#### By Hardware Supplier

8	Continuous Hinge	SL24HD x 2110 x TIPIT	628 / US28 / Clear Anodized	Select	
8	Passage Set	LV9010-03B	630 / US32D / Satin Stainless Steel	Schlage	
8	Electric Strike	1500C	630 / US32D / Satin Stainless Steel	HES	
8	Overhead Stop	106S	630 / US32D / Satin Stainless Steel	Glynn Johnson	
8	Kick Plate	K10F 203 x 1150 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
8	Mop Plate	K10F 125 x 1150 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
8	Edge Guard	K38 x 2135 (cutout for latch)	630 / US32D / Satin Stainless Steel	Standard Metal	

SPYDER SC

16	Half Frame Guard	K51 x 1219	630 / US32D / Satin Stainless Steel	Standard Metal	
8	Gasketing	W-66 x 5600	Black	KN Crowder	
8	Door Sweep	W-24S x 1219	628 / US28 / Clear Anodized	KN Crowder	
By Automatic Operator Supplier					
8	Auto Operator	BESAM SW200i – PULL SIDE MOUNT	628 / US28 / Clear Anodized	Besam	
16	Column Push Plate Actuator	CM-7536SS/4	630 / US32D / Satin Stainless Steel	Camden	
16	Presence Sensor	OA-Edge1T	Black	BEA	

## Notes:

- 120VAC is required at the head of the door for all barrier free door operators, 15A dedicated circuit. Wall/Frame must be reinforced for automatic operator mounting, all conduit and back boxes for actuators, emergency call kits, and washroom locking kits with pull cords are to be provided by the electrical contractor.

.....End of Heading.....














Heading#

3

Opening Information					
Opening Type:	Single	Opening Size:	965 x 2135 x 45	STC Rating	None
Door Material:	HMD	Frame Material:	HMF	Fire Rating	None

1	Total Openings							
1	Door#	K2E05	Location:	CORRIDOR 01	To	PHYSICIAN WORK ROOM K2E 05	Handing:	RH

By Hardware Supplier					
1	Continuous Hinge	SL24HD x 2110 x TIPIT	628 / US28 / Clear Anodized	Select	
1	Mortise Storeroom Lockset	LV9080BDC x 03B x 630	630 / US32D / Satin Stainless Steel	Schlage	
1	Electric Strike	1500C x LMB	630 / US32D / Satin Stainless Steel	HES	
1	Closer	4041XP– REG MOUNT	689 / US28 / Painted Aluminum	LCN	
1	Mounting Plate	4040XP-18TJ	689 / US28 / Painted Aluminum	LCN	
1	Overhead Stop	104S	630 / US32D / Satin Stainless Steel	Glynn Johnson	
1	Kick Plate	K10F 203 x 927 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Mop Plate	K10F 125 x 927 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
2	Half Frame Guard	K51 x 1219	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Gasketing	W-66 x 5600	Black	KN Crowder	
1	Auto Door Bottom	CT-54 x 965	628 / US28 / Clear Anodized	KN Crowder	
By Security Supplier					
1	Card Reader	By Security Supplier – To Suit Building System			
1	Door Contact	By Security Supplier			
1	Request to Exit Sensor	By Security Supplier			
1	Access Controller	By Security Supplier			
1	Power Supply	By Security Supplier – Powered by Security Panel			
By Owner					
1	Permanent Core	Best Coremax SFIC by Sunnybrook Locksmith		Best	



## Notes:

- Final commissioning of all access control items, such as but not limited to electric strikes, Rex sensors, Door contacts, Electrified Panics, Relays & Maglocks is the responsibility of the security provider

-----End of Heading-----




Heading#

4

Opening Information					
Opening Type:	Single	Opening Size:	965 x 2135 x 45	STC Rating	None
Door Material:	HMD	Frame Material:	HMF	Fire Rating	None

1	Total Openings							
1	Door#	K2E22	Location:	CORRIDOR 01	To	STAFF WR K2E 22	Handing:	RH

By Hardware Supplier					
1	Continuous Hinge	SL24HD x 2110 x TIPIT	628 / US28 / Clear Anodized	Select	
1	Mortise Storeroom Lockset	LV9080BDC x 03B x 630	630 / US32D / Satin Stainless Steel	Schlage	
1	Electric Strike	1500C	630 / US32D / Satin Stainless Steel	HES	
1	Overhead Stop	104S	630 / US32D / Satin Stainless Steel	Glynn Johnson	
1	Edge Guard	K38 x 2135 (cutout for latch)	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Kick Plate	K10F 203 x 895 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Mop Plate	K10F 125 x 895 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
2	Half Frame Guard	K51 x 1219	630 / US32D / Satin Stainless Steel	Standard Metal	
2	Coat Hook	1150-SS Safety Coat Hook	630	Frost	
1	Gasketing	W-66 x 5600	Black	KN Crowder	
1	Door Sweep	W-24S x 965	628 / US28 / Clear Anodized	KN Crowder	
By Automatic Operator Supplier					
1	Auto Operator	BESAM SW200i - Pull	628 / US28 / Clear Anodized	Besam	
1	Column Push to Lock Kit	CX-WC17	628 / US28 / Clear Anodized	Camden	
1	Logic Relay	CX-33		Camden	

2	Safety Sensor	Bodyguard - BLK		BEA	
By Security Supplier					
1	Card Reader	By Security Supplier – To Suit Building System			
1	Door Contact	By Security Supplier			
1	Request to Exit Sensor	By Security Supplier – Tied into Push to Open Button inside washroom.			
1	Access Controller	By Security Supplier			
1	Power Supply	By Security Supplier – Powered by Security Panel			
By Owner					
1	Permanent Core	Best Coremax SFIC by Sunnybrook Locksmith		Best	

## Notes:

- 120VAC is required at the head of the door for all barrier free door operators, 15A dedicated circuit. Wall/Frame must be reinforced for automatic operator mounting, all conduit and back boxes for actuators, emergency call kits, and washroom locking kits with pull cords are to be provided by the electrical contractor.
- Electrician to confirm wire locations with auto door operator supplier prior to pulling wires.

-----End of Heading-----












Heading#

5

Opening Information					
Opening Type:	Single	Opening Size:	1177 x 2135 x 45	STC Rating	None
Door Material:	SCWD	Frame Material:	HMF	Fire Rating	None

1	Total Openings							
1	Door#	K2E48	Location:	EXISTING CORRIDOR	To	APN OFFICE K2E 48	Handing:	RH

By Hardware Supplier					
1	Continuous Hinge	SL24HD x 2110 x TIPIT	628 / US28 / Clear Anodized	Select	
1	Mortise Storeroom Lockset	LV9080BDC x 03B x 630	630 / US32D / Satin Stainless Steel	Schlage	
1	Electric Strike	1500C x LMB	630 / US32D / Satin Stainless Steel	HES	
1	Closer	4041XP– REG MOUNT	689 / US28 / Painted Aluminum	LCN	
1	Mounting Plate	4040XP-18TJ	689 / US28 / Painted Aluminum	LCN	
1	Overhead Stop	106S	630 / US32D / Satin Stainless Steel	Glynn Johnson	
1	Edge Guard	K38 x 2135 (cutout for latch)	630 / US32D / Satin Stainless Steel	Standard Metal	
2	Half Frame Guard	K51 x 1219	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Gasketing	W-66 x 5600	Black	KN Crowder	
1	Auto Door Bottom	CT-51 x 1177	628 / US28 / Clear Anodized	KN Crowder	
By Security Supplier					
1	Card Reader	By Security Supplier – To Suit Building System			
1	Door Contact	By Security Supplier			
1	Request to Exit Sensor	By Security Supplier			
1	Access Controller	By Security Supplier			
1	Power Supply	By Security Supplier – Powered by Security Panel			
By Owner					
1	Permanent Core	Best Coremax SFIC by Sunnybrook Locksmith		Best	

## Notes:

- Final commissioning of all access control items, such as but not limited to electric strikes, Rex sensors, Door contacts, Electrified

Panics, Relays & Maglocks is the responsibility of the security provider












-----End of Heading-----

Heading#

6

Opening Information					
Opening Type:	Single	Opening Size:	874 x 2135 x 45	STC Rating	None
Door Material:	SCWD	Frame Material:	HMF	Fire Rating	None

1	Total Openings							
1	Door#	K2E45	Location:	CORRIDOR 01	To	PT/OT STORAGE K2E 450	Handing:	RH

By Hardware Supplier					
1	Continuous Hinge	SL24HD x 2110 x TIPIT	628 / US28 / Clear Anodized	Select	
1	Mortise Storeroom Lockset	LV9080BDC x 03B x 630	630 / US32D / Satin Stainless Steel	Schlage	
1	Closer	4041XP- REG MOUNT	689 / US28 / Painted Aluminum	LCN	
1	Mounting Plate	4040XP-18TJ	689 / US28 / Painted Aluminum	LCN	
1	Overhead Stop	104S	630 / US32D / Satin Stainless Steel	Glynn Johnson	
1	Edge Guard	K38 x 2135 (cutout for latch)	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Kick Plate	K10F 203 x 804 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Mop Plate	K10F 125 x 804 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
2	Half Frame Guard	K51 x 1219	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Gasketing	W-66 x 5600	Black	KN Crowder	
1	Door Sweep	W-24S x 874	628 / US28 / Clear Anodized	KN Crowder	
By Owner					
1	Permanent Core	Best Coremax SFIC by Sunnybrook Locksmith		Best	










-----End of Heading-----

Heading#

7

Opening Information					
Opening Type:	Single	Opening Size:	1219 x 2135 x 45	STC Rating	None
Door Material:	SCWD	Frame Material:	HMF	Fire Rating	None

1	Total Openings							
1	Door#	K2EC01	Location:	EXISTING CORRIDOR	To	CONFERENCE MULTI-PURPOSE ROOM K2E C01	Handing:	RH

By Hardware Supplier					
1	Continuous Hinge	SL24HD x 2110 x TIPIT	628 / US28 / Clear Anodized	Select	
1	Mortise Classroom Lockset	LV9070BDC x 03B x 630	630 / US32D / Satin Stainless Steel	Schlage	
1	Closer	4041XP- REG MOUNT	689 / US28 / Painted Aluminum	LCN	
1	Mounting Plate	4040XP-18TJ	689 / US28 / Painted Aluminum	LCN	
1	Overhead Stop	106F (with hold open)	630 / US32D / Satin Stainless Steel	Glynn Johnson	
1	Edge Guard	K38 x 2135 (cutout for latch)	630 / US32D / Satin Stainless Steel	Standard Metal	
2	Half Frame Guard	K51 x 1219	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Gasketing	W-66 x 5600	Black	KN Crowder	
1	Auto Door Bottom	CT-51 x 1219	628 / US28 / Clear Anodized	KN Crowder	
By Owner					
1	Permanent Core	Best Coremax SFIC by Sunnybrook Locksmith		Best	

.....End of Heading.....



Heading#

8

## Opening Information

<b>Opening Type:</b>	Pair	<b>Opening Size:</b>	2 x 900 x 2135 x 45	<b>STC Rating</b>	None
<b>Door Material:</b>	SCWD	<b>Frame Material:</b>	HMF	<b>Fire Rating</b>	3/4 HR

## 1 Total Openings

1	<b>Door#</b>	K2E51	<b>Location:</b>	EXISTING CORRIDOR	to/from	CORRIDOR 02	<b>Handing:</b>	DE
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## By Hardware Supplier

2	Continuous Hinge	SL24HD x 2110 x TIPIT x EPT	628 / US28 / Clear Anodized	Select	
2	Power Transfer	EPT-10	628 / US28 / Clear Anodized	Von Duprin	
1	Elec. Exit Device	LBR-RX-LX-QEL-9847WDC-EO-F x 3'0 RHR	630 / US32D / Satin Stainless Steel	Von Duprin	
1	Elec. Exit Device	LBR-RX-LX-QEL-9847WDC-EO-F x 3'0 RHR	630 / US32D / Satin Stainless Steel	Von Duprin	
2	Overhead Stop	103S* (Confirm with Template)	630 / US32D / Satin Stainless Steel	Glynn Johnson	
2	Edge Guard	K38 x 2135 (cutout for latch)	630 / US32D / Satin Stainless Steel	Standard Metal	
4	Kick Plate	K10F 203 x 830 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
2	Half Frame Guard	K51 x 1219	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Gasketing	W-66 x 7800	Black	KN Crowder	
2	Door Sweep	W-24S x 900	628 / US28 / Clear Anodized	KN Crowder	
1	Astragal	W-25 x 2135	628 / US28 / Clear Anodized	KN Crowder	
1	Power Supply	PS904-4RS-FA	600 / USP / Primed	Von Duprin	

## By Automatic Operator Supplier

1	Auto Operator (Pair) DE	BESAM SW200i – DOUBLE EGRESS DOOR ADO SETUP – PUSH SIDE MOUNT	628 / US28 / Clear Anodized	Besam	
2	Column Push Plate Actuator	CM-7536SS/4	630 / US32D / Satin Stainless Steel	Camden	
1	Logic Relay	CX-33		Camden	
2	Presence Sensor	OA-Edge1T	Black	BEA	

## By Security Supplier

1	Card Reader	By Security Supplier – To Suit Building System			
2	Door Contact	By Security Supplier			

2	Maglock	By Security Supplier			
1	Push to Exit	Integrate using REX Sensor in Push Bar & ADO Button			
1	FA Pull Station	By Security Supplier			
1	FA Integration	By Security Supplier			
1	Request to Exit Sensor	Integrated into Push Bar – Security to Wire			
1	Access Controller	By Security Supplier			
1	Power Supply	By Security Supplier – Powered by Security Panel			
By Fire Alarm Integrator					
1	Hold Open	By FA Integrator – Tied into ADO Hold Open Module			

## Notes:

- 120VAC is required at the head of the door for all barrier free door operators, 15A dedicated circuit. Wall/Frame must be reinforced for automatic operator mounting, all conduit and back boxes for actuators, emergency call kits, and washroom locking kits with pull cords are to be provided by the electrical contractor.
- Electrician to confirm wire locations with auto door operator supplier prior to pulling wires.
- Final commissioning of all access control items, such as but not limited to electric strikes, Rex sensors, Door contacts, Electrified Panics, Relays & Maglocks is the responsibility of the security provider

-----End of Heading-----



Heading#

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## Opening Information

<b>Opening Type:</b>	Pair	<b>Opening Size:</b>	2 x 900 x 2135 x 45	<b>STC Rating</b>	None
<b>Door Material:</b>	SCWD	<b>Frame Material:</b>	HMF	<b>Fire Rating</b>	3/4 HR

<b>1</b>	<b>Total Openings</b>							
1	<b>Door#</b>	K2E52	<b>Location:</b>	EXISTING CORRIDOR	to/from	CORRIDOR 01	<b>Handing:</b>	DE

## By Hardware Supplier

2	Continuous Hinge	SL24HD x 2110 x TIPIT x EPT	628 / US28 / Clear Anodized	Select	
2	Power Transfer	EPT-10	628 / US28 / Clear Anodized	Von Duprin	
1	Elec. Exit Device	LBR-RX-LX-QEL-9847WDC-EO-F x 3'0 RHR	630 / US32D / Satin Stainless Steel	Von Duprin	
1	Elec. Exit Device	LBR-RX-LX-QEL-9847WDC-EO-F x 3'0 RHR	630 / US32D / Satin Stainless Steel	Von Duprin	
2	Overhead Stop	103S* (Confirm with Template)	630 / US32D / Satin Stainless Steel	Glynn Johnson	
2	Edge Guard	K38 x 2135 (cutout for latch)	630 / US32D / Satin Stainless Steel	Standard Metal	

4	Kick Plate	K10F 203 x 830 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
2	Half Frame Guard	K51 x 1219	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Gasketing	W-66 x 7800	Black	KN Crowder	
2	Door Sweep	W-24S x 900	628 / US28 / Clear Anodized	KN Crowder	
1	Astragal	W-25 x 2135	628 / US28 / Clear Anodized	KN Crowder	
1	Power Supply	PS904-4RS-FA	600 / USP / Primed	Von Duprin	
By Automatic Operator Supplier					
1	Auto Operator (Pair) DE	BESAM SW200i – DOUBLE EGRESS DOOR ADO SETUP – PUSH SIDE MOUNT	628 / US28 / Clear Anodized	Besam	
2	Column Push Plate Actuator	CM-7536SS/4	630 / US32D / Satin Stainless Steel	Camden	
1	Logic Relay	CX-33		Camden	
2	Presence Sensor	OA-Edge1T	Black	BEA	
By Security Supplier					
1	Card Reader	By Security Supplier – To Suit Building System			
2	Door Contact	By Security Supplier			
2	Maglock	By Security Supplier			
1	Push to Exit	Integrate using REX Sensor in Push Bar & ADO Button			
1	FA Pull Station	By Security Supplier			
1	FA Integration	By Security Supplier			
1	Request to Exit Sensor	Integrated into Push Bar – Security to Wire			
1	Access Controller	By Security Supplier			
1	Power Supply	By Security Supplier – Powered by Security Panel			
By Fire Alarm Integrator					
1	Hold Open	By FA Integrator – Tied into ADO Hold Open Module			

## Notes:

- 120VAC is required at the head of the door for all barrier free door operators, 15A dedicated circuit. Wall/Frame must be reinforced for automatic operator mounting, all conduit and back boxes for actuators, emergency call kits, and washroom locking kits with pull cords are to be provided by the electrical contractor.
- Electrician to confirm wire locations with auto door operator supplier prior to pulling wires.
- Final commissioning of all access control items, such as but not limited to electric strikes, Rex sensors, Door contacts, Electrified Panics, Relays & Maglocks is the responsibility of the security provider

-----End of Heading-----





Heading#

10

## Opening Information

Opening Type:	Pair	Opening Size:	2 x 900 x 2135 x 45	STC Rating	None
Door Material:	SCWD	Frame Material:	HMF	Fire Rating	3/4 HR

1	Total Openings							
1	Door#	K3E51	Location:	EXISTING CORRIDOR	to/from	CORRIDOR	Handing:	DE

## By Hardware Supplier

2	Continuous Hinge	SL24HD x 2110 x TIPIT x EPT	628 / US28 / Clear Anodized	Select	
2	Power Transfer	EPT-10	628 / US28 / Clear Anodized	Von Duprin	
1	Elec. Exit Device	LBR-RX-LX-QEL-9847WDC-EO-F x 3'0 RHR	630 / US32D / Satin Stainless Steel	Von Duprin	
1	Elec. Exit Device	LBR-RX-LX-QEL-9847WDC-EO-F x 3'0 RHR	630 / US32D / Satin Stainless Steel	Von Duprin	
2	Overhead Stop	103S* (Confirm with Template)	630 / US32D / Satin Stainless Steel	Glynn Johnson	
2	Edge Guard	K38 x 2135 (cutout for latch)	630 / US32D / Satin Stainless Steel	Standard Metal	
4	Kick Plate	K10F 864 x 830 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
2	Half Frame Guard	K51 x 1219	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Gasketing	W-66 x 7800	Black	KN Crowder	
2	Door Sweep	W-24S x 900	628 / US28 / Clear Anodized	KN Crowder	
1	Astragal	W-25 x 2135	628 / US28 / Clear Anodized	KN Crowder	
1	Power Supply	PS904-4RS-FA	600 / USP / Primed	Von Duprin	

## By Automatic Operator Supplier

1	Auto Operator (Pair) DE	BESAM SW200i – DOUBLE EGRESS DOOR ADO SETUP – PUSH SIDE MOUNT	628 / US28 / Clear Anodized	Besam	
2	Column Push Plate Actuator	CM-7536SS/4	630 / US32D / Satin Stainless Steel	Camden	
1	Logic Relay	CX-33		Camden	
2	Presence Sensor	OA-Edge1T	Black	BEA	

## By Fire Alarm Integrator

1	Hold Open	By FA Integrator – Tied into ADO Hold Open Module			
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## Notes:

- 120VAC is required at the head of the door for all barrier free door operators, 15A dedicated circuit. Wall/Frame must be reinforced for automatic operator mounting, all conduit and back boxes for actuators, emergency call kits, and washroom locking kits with pull cords are to be provided by the electrical contractor.
- Electrician to confirm wire locations with auto door operator supplier prior to pulling wires.
- Final commissioning of all access control items, such as but not limited to electric strikes, Rex sensors, Door contacts, Electrified Panics, Relays & Maglocks is the responsibility of the security provider

-----End of Heading-----



Heading#

11

## Opening Information

<b>Opening Type:</b>	Pair	<b>Opening Size:</b>	2 x 900 x 2135 x 45	<b>STC Rating</b>	None
<b>Door Material:</b>	SCWD	<b>Frame Material:</b>	HMF	<b>Fire Rating</b>	3/4 HR





1	Total Openings							
1	Door#	K3E50	Location:	EXISTING CORRIDOR	to/from	CORRIDOR	Handing:	LHR/RHR

## By Hardware Supplier

2	Continuous Hinge	SL24HD x 2110 x TIPIT x EPT	628 / US28 / Clear Anodized	Select	
2	Power Transfer	EPT-10	628 / US28 / Clear Anodized	Von Duprin	
1	Elec. Exit Device	LBR-RX-LX-QEL-9847WDC-EO-F x 3'0 RHR	630 / US32D / Satin Stainless Steel	Von Duprin	
1	Elec. Exit Device	LBR-RX-LX-QEL-9847WDC-EO-F x 3'0 RHR	630 / US32D / Satin Stainless Steel	Von Duprin	
2	Overhead Stop	103S* (Confirm with Template)	630 / US32D / Satin Stainless Steel	Glynn Johnson	
2	Edge Guard	K38 x 2135 (cutout for latch)	630 / US32D / Satin Stainless Steel	Standard Metal	
4	Kick Plate	K10F 864 x 830 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
2	Half Frame Guard	K51 x 1219	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Gasketing	W-66 x 7800	Black	KN Crowder	
2	Door Sweep	W-24S x 900	628 / US28 / Clear Anodized	KN Crowder	
1	Astragal	W-25 x 2135	628 / US28 / Clear Anodized	KN Crowder	
1	Power Supply	PS904-4RS-FA	600 / USP / Primed	Von Duprin	

## By Automatic Operator Supplier

SPYDER SC

1	Auto Operator (Pair) DE	BESAM SW200i – DOUBLE EGRESS DOOR ADO SETUP – PUSH SIDE MOUNT	628 / US28 / Clear Anodized	Besam	
2	Column Push Plate Actuator	CM-7536SS/4	630 / US32D / Satin Stainless Steel	Camden	
1	Logic Relay	CX-33		Camden	
2	Presence Sensor	OA-Edge1T	Black	BEA	
By Fire Alarm Integrator					
1	Hold Open	By FA Integrator – Tied into ADO Hold Open Module			

## Notes:

- 120VAC is required at the head of the door for all barrier free door operators, 15A dedicated circuit. Wall/Frame must be reinforced for automatic operator mounting, all conduit and back boxes for actuators, emergency call kits, and washroom locking kits with pull cords are to be provided by the electrical contractor.
- Electrician to confirm wire locations with auto door operator supplier prior to pulling wires.
- Final commissioning of all access control items, such as but not limited to electric strikes, Rex sensors, Door contacts, Electrified Panics, Relays & Maglocks is the responsibility of the security provider

-----End of Heading-----



Heading#

12





## Opening Information

Opening Type:	Single	Opening Size:	1219 x 2135 x 45	STC Rating	None
Door Material:	SCWD	Frame Material:	HMF	Fire Rating	0 HR

8	Total Openings							
1	Door#	K3E02	Location:	CORRIDOR	To	3 - BED SUITE K3E 02	Handing:	LH
1	Door#	K3E04	Location:	CORRIDOR	To	3 - BED SUITE K3E 04	Handing:	RH
1	Door#	K3E14	Location:	CORRIDOR	To	3 - BED SUITE K3E 14	Handing:	LH
1	Door#	K3E16	Location:	CORRIDOR	To	3 - BED SUITE K3E 16	Handing:	RH
1	Door#	K3E21	Location:	CORRIDOR	To	3 - BED SUITE K3E 21	Handing:	LH
1	Door#	K3E23	Location:	CORRIDOR	To	3 - BED SUITE K3E 23	Handing:	RH
1	Door#	K3E33	Location:	CORRIDOR	To	3 - BED SUITE K3E 33	Handing:	LH
1	Door#	K3E35	Location:	CORRIDOR	To	3 - BED SUITE K3E 35	Handing:	RH

## By Hardware Supplier

8	Continuous Hinge	SL24HD x 2110 x TIPIT	628 / US28 / Clear Anodized	Select	
8	Passage Set	LV9010-03B	630 / US32D / Satin Stainless Steel	Schlage	
8	Electric Strike	1500C	630 / US32D / Satin Stainless Steel	HES	
8	Overhead Stop	106S	630 / US32D / Satin Stainless Steel	Glynn Johnson	
8	Kick Plate	K10F 203 x 1150	630 / US32D / Satin Stainless Steel	Standard Metal	
8	Mop Plate	K10F 125 x 1150 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
8	Edge Guard	K38 x 2135 (cutout for latch)	630 / US32D / Satin Stainless Steel	Standard Metal	
16	Half Frame Guard	K51 x 1219	630 / US32D / Satin Stainless Steel	Standard Metal	
8	Gasketing	W-66 x 5600	Black	KN Crowder	

8	Door Sweep	W-24S x 1219	628 / US28 / Clear Anodized	KN Crowder	
By Automatic Operator Supplier					
8	Auto Operator	BESAM SW200i – PULL SIDE MOUNT	628 / US28 / Clear Anodized	Besam	
16	Column Push Plate Actuator	CM-7536SS/4	630 / US32D / Satin Stainless Steel	Camden	
16	Presence Sensor	OA-Edge1T	Black	BEA	

## Notes:

- 120VAC is required at the head of the door for all barrier free door operators, 15A dedicated circuit. Wall/Frame must be reinforced for automatic operator mounting, all conduit and back boxes for actuators, emergency call kits, and washroom locking kits with pull cords are to be provided by the electrical contractor.












-----End of Heading-----

Heading#

13

Opening Information					
Opening Type:	Single	Opening Size:	874 x 2135 x 45	STC Rating	None
Door Material:	SCWD	Frame Material:	HMF	Fire Rating	None

1	Total Openings							
1	Door#	K3E05	Location:	CORRIDOR	To	CHARTING ROOM K3E 05	Handing:	LH

By Hardware Supplier					
1	Continuous Hinge	SL24HD x 2110 x TIPIT	628 / US28 / Clear Anodized	Select	
1	Mortise Classroom Lockset	LV9070BDC x 03B x 630	630 / US32D / Satin Stainless Steel	Schlage	
1	Closer	4041XP- REG MOUNT	689 / US28 / Painted Aluminum	LCN	
1	Mounting Plate	4040XP-18TJ	689 / US28 / Painted Aluminum	LCN	
1	Overhead Stop	104F (with hold open)	630 / US32D / Satin Stainless Steel	Glynn Johnson	
1	Edge Guard	K38 x 2135 (cutout for latch)	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Kick Plate	K10F 203 x 804 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Mop Plate	K10F 125 x 804 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
2	Half Frame Guard	K51 x 1219	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Gasketing	W-66 x 5600	Black	KN Crowder	
2	Door Sweep	W-24S x 874	628 / US28 / Clear Anodized	KN Crowder	
By Owner					
1	Permanent Core	Best Coremax SFIC by Sunnybrook Locksmith		Best	

.....End of Heading.....



Heading#

14

## Opening Information

Opening Type:	Single	Opening Size:	1219 x 2135 x 45 LEAD LINED	STC Rating	None
Door Material:	SCWD -LL	Frame Material:	HMF-LL	Fire Rating	0 HR

2	Total Openings							
1	Door#	K3E08	Location:	CORRIDOR	To	1 - BED SUITE K3E 08	Handing:	LH
1	Door#	K3E010	Location:	CORRIDOR	To	1 - BED SUITE K3E 08	Handing:	RH

## By Hardware Supplier

2	Continuous Hinge	SL24HD-LL x 2108 (rivnuts) Tippit	628 / US28 / Clear Anodized	Select	
2	Storeroom Lockset	LV9080BDC-03B x XL11-515	630 / US32D / Satin Stainless Steel	Schlage	
2	Electric Strike	1500C	630 / US32D / Satin Stainless Steel	HES	
2	Overhead Stop	106S	630 / US32D / Satin Stainless Steel	Glynn Johnson	
2	Kick Plate	K10F 203 x 1150	630 / US32D / Satin Stainless Steel	Standard Metal	
2	Mop Plate	K10F 125 x 1150 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
2	Edge Guard	K38 x 2135 (cutout for latch)	630 / US32D / Satin Stainless Steel	Standard Metal	
4	Half Frame Guard	K51 x 1219	630 / US32D / Satin Stainless Steel	Standard Metal	
2	Gasketing	W-66 x 5600	Black	KN Crowder	
2	Door Sweep	W-24S x 965	628 / US28 / Clear Anodized	KN Crowder	

## By Automatic Operator Supplier

2	Auto Operator	BESAM SW200i – PULL SIDE MOUNT	628 / US28 / Clear Anodized	Besam	
4	Column Push Plate Actuator	CM-7536SS/4	630 / US32D / Satin Stainless Steel	Camden	
2	Presence Sensor	OA-Edge1T	Black	BEA	
1	Logic Relay	CX-33		Camden	

## By Security Supplier

1	Card Reader	By Security Supplier – To Suit Building System			
1	Door Contact	By Security Supplier			
1	Request to Exit Sensor	By Security Supplier			

1	Access Controller	By Security Supplier			
1	Power Supply	By Security Supplier – Powered by Security Panel			
By Owner					
1	Permanent Core	Best Coremax SFIC by Sunnybrook Locksmith		Best	

## Notes:

- 120VAC is required at the head of the door for all barrier free door operators, 15A dedicated circuit. Wall/Frame must be reinforced for automatic operator mounting, all conduit and back boxes for actuators, emergency call kits, and washroom locking kits with pull cords are to be provided by the electrical contractor.

-----End of Heading-----



Heading# 15

Opening Information					
Opening Type:	Single	Opening Size:	965 x 2135 x 45	STC Rating	None
Door Material:	SCWD	Frame Material:	HMF	Fire Rating	None

1	Total Openings							
1	Door#	K3E09	Location:	ACTIVITY ROOM K3E 11	To	RECEPTION K3E 09	Handing:	RH

By Hardware Supplier					
1	Continuous Hinge	SL24HD x 2110 x TIPIT	628 / US28 / Clear Anodized	Select	
1	Mortise Storeroom Lockset	LV9080BDC x 03B x 630	630 / US32D / Satin Stainless Steel	Schlage	
1	Electric Strike	1500C x LMB	630 / US32D / Satin Stainless Steel	HES	
1	Closer	4041XP- REG MOUNT	689 / US28 / Painted Aluminum	LCN	
1	Mounting Plate	4040XP-18TJ	689 / US28 / Painted Aluminum	LCN	
1	Overhead Stop	104S	630 / US32D / Satin Stainless Steel	Glynn Johnson	
1	Edge Guard	K38 x 2135 (cutout for latch)	630 / US32D / Satin Stainless Steel	Standard Metal	
2	Half Frame Guard	K51 x 1219	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Gasketing	W-66 x 5600	Black	KN Crowder	
1	Auto Door Bottom	CT-51 x 965	628 / US28 / Clear Anodized	KN Crowder	
By Security Supplier					



1	Card Reader	By Security Supplier – To Suit Building System			
1	Door Contact	By Security Supplier			
1	Request to Exit Sensor	By Security Supplier			
1	Access Controller	By Security Supplier			
1	Power Supply	By Security Supplier – Powered by Security Panel			
By Owner					
1	Permanent Core	Best Coremax SFIC by Sunnybrook Locksmith		Best	

## Notes:

- Final commissioning of all access control items, such as but not limited to electric strikes, Rex sensors, Door contacts, Electrified Panics, Relays & Maglocks is the responsibility of the security provider

.....End of Heading.....



Heading#

16

## Opening Information

Opening Type:	Single	Opening Size:	965 x 2135 x 45 LEAD LINED	STC Rating	None
Door Material:	SCWD -LL	Frame Material:	HMF-LL	Fire Rating	0 HR

1	Total Openings							
1	Door#	K3E13	Location:	CORRIDOR	To	SHOWER K3E 13	Handing:	LH

## By Hardware Supplier

1	Continuous Hinge	SL24HD-LL x 2108 (rivnuts) Tippit	628 / US28 / Clear Anodized	Select	
1	Storeroom Lockset	LV9080-03B x XL11-515	630 / US32D / Satin Stainless Steel	Schlage	
1	Electric Strike	1500C	630 / US32D / Satin Stainless Steel	HES	
1	Overhead Stop	104S	630 / US32D / Satin Stainless Steel	Glynn Johnson	
1	Kick Plate	K10F 203 x 895	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Mop Plate	K10F 125 x 895 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Edge Guard	K38 x 2135 (cutout for latch)	630 / US32D / Satin Stainless Steel	Standard Metal	
2	Half Frame Guard	K51 x 1219	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Gasketing	W-66 x 5600	Black	KN Crowder	
1	Door Sweep	W-24S x 965	628 / US28 / Clear Anodized	KN Crowder	

## By Automatic Operator Supplier

1	Auto Operator	BESAM SW200i – PULL SIDE MOUNT	628 / US28 / Clear Anodized	Besam	
1	Column Push to Lock Kit	CX-WC17	628 / US28 / Clear Anodized	Camden	
1	Logic Relay	CX-33		Camden	
2	Presence Sensor	OA-Edge1T	Black	BEA	

## By Owner

1	Permanent Core	Best Coremax SFIC by Sunnybrook Locksmith		Best	
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## Notes:

- 120VAC is required at the head of the door for all barrier free door operators, 15A dedicated circuit. Wall/Frame must be reinforced for automatic operator mounting, all conduit and back boxes for actuators, emergency call kits, and washroom locking kits with pull cords are to be provided by the electrical contractor.










-----End of Heading-----

Heading#

17

Opening Information					
Opening Type:	Single	Opening Size:	965 x 2135 x 45	STC Rating	None
Door Material:	SCWD	Frame Material:	HMF	Fire Rating	None

1	Total Openings							
1	Door#	K3E30	Location:	EXISTING CORRIDOR	To	FAMILY LOUNGE K3E 30	Handing:	RH

By Hardware Supplier					
1	Continuous Hinge	SL24HD x 2110 x TIPIT	628 / US28 / Clear Anodized	Select	
1	Mortise Classroom Lockset	LV9070BDC x 03B x 630	630 / US32D / Satin Stainless Steel	Schlage	
1	Closer	4041XP- REG MOUNT	689 / US28 / Painted Aluminum	LCN	
1	Mounting Plate	4040XP-18TJ	689 / US28 / Painted Aluminum	LCN	
1	Overhead Stop	104F (with hold open)	630 / US32D / Satin Stainless Steel	Glynn Johnson	
1	Edge Guard	K38 x 2135 (cutout for latch)	630 / US32D / Satin Stainless Steel	Standard Metal	
2	Half Frame Guard	K51 x 1219	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Gasketing	W-66 x 5600	Black	KN Crowder	
1	Auto Door Bottom	CT-51 x 965	628 / US28 / Clear Anodized	KN Crowder	
By Owner					
1	Permanent Core	Best Coremax SFIC by Sunnybrook Locksmith		Best	

-----End of Heading-----



Heading#

18

## Opening Information

<b>Opening Type:</b>	Single	<b>Opening Size:</b>	1177 x 2135 x 45	<b>STC Rating</b>	None
<b>Door Material:</b>	SCWD	<b>Frame Material:</b>	HMF	<b>Fire Rating</b>	None

<b>1</b>	<b>Total Openings</b>							
1	<b>Door#</b>	K3E48	<b>Location:</b>	EXISTING CORRIDOR	To	PCM OFFICE K3E 48	<b>Handing:</b>	RH

## By Hardware Supplier

1	Continuous Hinge	SL24HD x 2110 x TIPIT	628 / US28 / Clear Anodized	Select	
1	Mortise Storeroom Lockset	LV9080BDC x 03B x 630	630 / US32D / Satin Stainless Steel	Schlage	
1	Electric Strike	1500C x LMB	630 / US32D / Satin Stainless Steel	HES	
1	Closer	4041XP- REG MOUNT	689 / US28 / Painted Aluminum	LCN	
1	Mounting Plate	4040XP-18TJ	689 / US28 / Painted Aluminum	LCN	
1	Overhead Stop	106S	630 / US32D / Satin Stainless Steel	Glynn Johnson	
1	Edge Guard	K38 x 2135 (cutout for latch)	630 / US32D / Satin Stainless Steel	Standard Metal	
2	Half Frame Guard	K51 x 1219	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Gasketing	W-66 x 5600	Black	KN Crowder	
1	Auto Door Bottom	CT-51 x 1177	628 / US28 / Clear Anodized	KN Crowder	

## By Security Supplier

1	Card Reader	By Security Supplier – To Suit Building System			
1	Door Contact	By Security Supplier			
1	Request to Exit Sensor	By Security Supplier			
1	Access Controller	By Security Supplier			
1	Power Supply	By Security Supplier – Powered by Security Panel			

## By Owner

1	Permanent Core	Best Coremax SFIC by Sunnybrook Locksmith		Best	
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## Notes:

- Final commissioning of all access control items, such as but not limited to electric strikes, Rex sensors, Door contacts, Electrified Panics, Relays & Maglocks is the responsibility of the security provider

End of Heading



Heading#

19

## Opening Information

<b>Opening Type:</b>	Single	<b>Opening Size:</b>	874 x 2135 x 45	<b>STC Rating</b>	None
<b>Door Material:</b>	HMD	<b>Frame Material:</b>	HMF	<b>Fire Rating</b>	3/4 HR

## 1 Total Openings

1	<b>Door#</b>	K2E15	<b>Location:</b>	CORRIDOR 02	From	EVS K2E 15	<b>Handing:</b>	LHR
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## By Hardware Supplier

1	Continuous Hinge	SL24HD x 2110 x TIPIT	628 / US28 / Clear Anodized	Select	
1	Mortise Storeroom Lockset	LV9080BDC x 03B x 630	630 / US32D / Satin Stainless Steel	Schlage	
1	Electric Strike	1500C x LMB	630 / US32D / Satin Stainless Steel	HES	
1	Closer	4041XP- PA	689 / US28 / Painted Aluminum	LCN	
1	Overhead Stop	104S	630 / US32D / Satin Stainless Steel	Glynn Johnson	
1	Kick Plate	K10F 203 x 836 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Mop Plate	K10F 125 x 849 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
2	Half Frame Guard	K51 x 1219	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Gasketing	W-66 x 5600	Black	KN Crowder	
1	Door Sweep	W-24S x 874	628 / US28 / Clear Anodized	KN Crowder	

## By Security Supplier

1	Card Reader	By Security Supplier – To Suit Building System			
1	Door Contact	By Security Supplier			
1	Request to Exit Sensor	By Security Supplier			
1	Access Controller	By Security Supplier			
1	Power Supply	By Security Supplier – Powered by Security Panel			

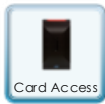
## By Owner

1	Permanent Core	Best Coremax SFIC by Sunnybrook Locksmith		Best	
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## Notes:

- Final commissioning of all access control items, such as but not limited to electric strikes, Rex sensors, Door contacts, Electrified Panics, Relays & Maglocks is the responsibility of the security provider

End of Heading



Heading#

20

## Opening Information

<b>Opening Type:</b>	Single	<b>Opening Size:</b>	874 x 2135 x 45	<b>STC Rating</b>	None
<b>Door Material:</b>	HMD	<b>Frame Material:</b>	HMF	<b>Fire Rating</b>	1 1/2 HR

## 1 Total Openings

1	<b>Door#</b>	K2E18	<b>Location:</b>	CORRIDOR 02	From	GARBAGE CHUTE ROOM K2E 18	<b>Handing:</b>	RHR
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## By Hardware Supplier

1	Continuous Hinge	SL24HD x 2110 x TIPIT	628 / US28 / Clear Anodized	Select	
1	Mortise Storeroom Lockset	LV9080BDC x 03B x 630	630 / US32D / Satin Stainless Steel	Schlage	
1	Electric Strike	1500C x LMB	630 / US32D / Satin Stainless Steel	HES	
1	Closer	4041XP- PA	689 / US28 / Painted Aluminum	LCN	
1	Overhead Stop	104S	630 / US32D / Satin Stainless Steel	Glynn Johnson	
1	Kick Plate	K10F 203 x 836 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Mop Plate	K10F 125 x 849 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
2	Half Frame Guard	K51 x 1219	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Gasketing	W-66 x 5600	Black	KN Crowder	
1	Door Sweep	W-24S x 874	628 / US28 / Clear Anodized	KN Crowder	

## By Security Supplier

1	Card Reader	By Security Supplier – To Suit Building System			
1	Door Contact	By Security Supplier			
1	Request to Exit Sensor	By Security Supplier			
1	Access Controller	By Security Supplier			
1	Power Supply	By Security Supplier – Powered by Security Panel			

## By Owner

1	Permanent Core	Best Coremax SFIC by Sunnybrook Locksmith		Best	
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## Notes:

- Final commissioning of all access control items, such as but not limited to electric strikes, Rex sensors, Door contacts, Electrified

Panics, Relays & Maglocks is the responsibility of the security provider

-----End of Heading-----













Heading#

21

Opening Information					
Opening Type:	Single	Opening Size:	874 x 2135 x 45	STC Rating	None
Door Material:	HMD	Frame Material:	HMF	Fire Rating	3/4 HR

1	Total Openings							
1	Door#	K3E15	Location:	CORRIDOR 02	From	EVS K3E 15	Handing:	LHR

By Hardware Supplier					
1	Continuous Hinge	SL24HD x 2110 x TIPIT	628 / US28 / Clear Anodized	Select	
1	Mortise Storeroom Lockset	LV9080BDC x 03B x 630	630 / US32D / Satin Stainless Steel	Schlage	
1	Electric Strike	1500C x LMB	630 / US32D / Satin Stainless Steel	HES	
1	Closer	4041XP– PA	689 / US28 / Painted Aluminum	LCN	
1	Overhead Stop	104S	630 / US32D / Satin Stainless Steel	Glynn Johnson	
1	Kick Plate	K10F 203 x 836 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Mop Plate	K10F 125 x 849 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
2	Half Frame Guard	K51 x 1219	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Gasketing	W-66 x 5600	Black	KN Crowder	
1	Door Sweep	W-24S x 874	628 / US28 / Clear Anodized	KN Crowder	
By Security Supplier					
1	Card Reader	By Security Supplier – To Suit Building System			
1	Door Contact	By Security Supplier			
1	Request to Exit Sensor	By Security Supplier			
1	Access Controller	By Security Supplier			
1	Power Supply	By Security Supplier – Powered by Security Panel			
By Owner					
1	Permanent Core	Best Coremax SFIC by Sunnybrook Locksmith		Best	

Notes:

SPYDER SC

- Final commissioning of all access control items, such as but not limited to electric strikes, Rex sensors, Door contacts, Electrified Panics, Relays & Maglocks is the responsibility of the security provider

-----End of Heading-----



Heading#

22

## Opening Information

<b>Opening Type:</b>	Single	<b>Opening Size:</b>	874 x 2135 x 45	<b>STC Rating</b>	None
<b>Door Material:</b>	HMD	<b>Frame Material:</b>	HMF	<b>Fire Rating</b>	1 1/2 HR

## 1 Total Openings

1	<b>Door#</b>	K3E17	<b>Location:</b>	CORRIDOR 02	From	CHUTES K3E 17	<b>Handing:</b>	RHR
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## By Hardware Supplier

1	Continuous Hinge	SL24HD x 21 10 x TIPIT	628 / US28 / Clear Anodized	Select	
1	Mortise Storeroom Lockset	LV9080BDC x 03B x 630	630 / US32D / Satin Stainless Steel	Schlage	
1	Electric Strike	1500C x LMB	630 / US32D / Satin Stainless Steel	HES	
1	Closer	4041XP- PA	689 / US28 / Painted Aluminum	LCN	
1	Overhead Stop	104S	630 / US32D / Satin Stainless Steel	Glynn Johnson	
1	Kick Plate	K10F 203 x 836 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Mop Plate	K10F 125 x 849 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
2	Half Frame Guard	K51 x 1219	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Gasketing	W-66 x 5600	Black	KN Crowder	
1	Door Sweep	W-24S x 874	628 / US28 / Clear Anodized	KN Crowder	

## By Security Supplier

1	Card Reader	By Security Supplier – To Suit Building System			
1	Door Contact	By Security Supplier			
1	Request to Exit Sensor	By Security Supplier			
1	Access Controller	By Security Supplier			
1	Power Supply	By Security Supplier – Powered by Security Panel			

## By Owner

1	Permanent Core	Best Coremax SFIC by Sunnybrook Locksmith		Best	
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## Notes:

- Final commissioning of all access control items, such as but not limited to electric strikes, Rex sensors, Door contacts, Electrified Panics, Relays & Maglocks is the responsibility of the security provider

-----End of Heading-----



Heading#

23

Opening Information					
Opening Type:	Single	Opening Size:	1219 x 2135 x 45	STC Rating	None
Door Material:	SCWD	Frame Material:	HMF	Fire Rating	None

1	Total Openings							
1	Door#	K3E12	Location:	ANTE ROOM K3E 49	To	1 - BED SUITE K3E 12	Handing:	LH

By Hardware Supplier					
1	Continuous Hinge	SL24HD x 2110 x TIPIT	628 / US28 / Clear Anodized	Select	
1	Passage Set	LV9010-03B	630 / US32D / Satin Stainless Steel	Schlage	
1	Electric Strike	1500C	630 / US32D / Satin Stainless Steel	HES	
1	Overhead Stop	106S	630 / US32D / Satin Stainless Steel	Glynn Johnson	
1	Kick Plate	K10F 203 x 1150	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Mop Plate	K10F 125 x 1150 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Edge Guard	K38 x 2135 (cutout for latch)	630 / US32D / Satin Stainless Steel	Standard Metal	
2	Half Frame Guard	K51 x 1219	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Gasketing	W-66 x 5600	Black	KN Crowder	
1	Door Sweep	W-24S x 1219	628 / US28 / Clear Anodized	KN Crowder	
By Automatic Operator Supplier					
1	Auto Operator	BESAM SW200i – PULL SIDE MOUNT	628 / US28 / Clear Anodized	Besam	
2	Column Push Plate Actuator	CM-7536SS/4	630 / US32D / Satin Stainless Steel	Camden	
2	Presence Sensor	OA-Edge1T	Black	BEA	

## Notes:

SPYDER SC

- 120VAC is required at the head of the door for all barrier free door operators, 15A dedicated circuit. Wall/Frame must be reinforced for automatic operator mounting, all conduit and back boxes for actuators, emergency call kits, and washroom locking kits with pull cords are to be provided by the electrical contractor.

-----End of Heading-----



Heading#

24

Opening Information					
Opening Type:	Single	Opening Size:	1219 x 2135 x 45	STC Rating	None
Door Material:	SCWD	Frame Material:	HMF	Fire Rating	None

<b>1</b>	<b>Total Openings</b>							
1	Door#	K3E12A	Location:	1 - BED SUITE K3E 12	To	PATIENT W/C K3E 12A	Handing:	LH

By Hardware Supplier					
1	Continuous Hinge	SL24HD x 2110 x TIPIT	628 / US28 / Clear Anodized	Select	
1	Storeroom Lockset	LV9080-03B	630 / US32D / Satin Stainless Steel	Schlage	
1	Electric Strike	1500C	630 / US32D / Satin Stainless Steel	HES	
1	Overhead Stop	106S	630 / US32D / Satin Stainless Steel	Glynn Johnson	
1	Armour Plate	K10F 864 x 1159 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Mop Plate	K10F 125 x 1170 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Edge Guard	K38 x 2135 (cutout for latch)	630 / US32D / Satin Stainless Steel	Standard Metal	
2	Half Frame Guard	K51 x 1219	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Gasketing	W-66 x 5600	Black	KN Crowder	
1	Door Sweep	W-24S x 1219	628 / US28 / Clear Anodized	KN Crowder	
By Automatic Operator Supplier					
1	Auto Operator	BESAM SW200i – PULL SIDE MOUNT	628 / US28 / Clear Anodized	Besam	
1	Column Push to Lock Kit	CX-WC17	628 / US28 / Clear Anodized	Camden	
1	Logic Relay	CX-33		Camden	
2	Presence Sensor	OA-Edge1T	Black	BEA	

By Owner				
1	Permanent Core	Best Coremax SFIC by Sunnybrook Locksmith		Best

Notes:

- 120VAC is required at the head of the door for all barrier free door operators, 15A dedicated circuit. Wall/Frame must be reinforced for automatic operator mounting, all conduit and back boxes for actuators, emergency call kits, and washroom locking kits with pull cords are to be provided by the electrical contractor.

.....End of Heading.....



Heading#

25

## Opening Information

Opening Type:	Single	Opening Size:	1219 x 2135 x 45	STC Rating	None
Door Material:	SCWD	Frame Material:	HMF	Fire Rating	0 HR

1	Total Openings							
1	Door#	K3E49	Location:	CORRIDOR 02	To	ANTE ROOM K3E 49	Handing:	LH

## By Hardware Supplier

1	Continuous Hinge	SL24HD x 2110 x TIPIT	628 / US28 / Clear Anodized	Select	
1	Mortise Storeroom Lockset	LV9080BDC x 03B x 630	630 / US32D / Satin Stainless Steel	Schlage	
1	Electric Strike	1500C	630 / US32D / Satin Stainless Steel	HES	
1	Overhead Stop	106S	630 / US32D / Satin Stainless Steel	Glynn Johnson	
1	Armour Plate	K10F 864 x 1159 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Mop Plate	K10F 125 x 1170 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Edge Guard	K38 x 2135 (cutout for latch)	630 / US32D / Satin Stainless Steel	Standard Metal	
2	Half Frame Guard	K51 x 1219	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Gasketing	W-66 x 5600	Black	KN Crowder	
1	Door Sweep	W-24S x 1219	628 / US28 / Clear Anodized	KN Crowder	

## By Automatic Operator Supplier

1	Auto Operator	BESAM SW200i - Pull	628 / US28 / Clear Anodized	Besam	
2	Column Push Plate Actuator	CM-7536SS/4	630 / US32D / Satin Stainless Steel	Camden	
1	Logic Relay	CX-33		Camden	
2	Safety Sensor	Bodyguard - BLK		BEA	

## By Security Supplier

1	Card Reader	By Security Supplier – To Suit Building System			
1	Door Contact	By Security Supplier			
1	Request to Exit Sensor	By Security Supplier – Tied into Push to Open Button inside washroom.			
1	Access Controller	By Security Supplier			

1	Power Supply	By Security Supplier – Powered by Security Panel			
By Owner					
1	Permanent Core	Best Coremax SFIC by Sunnybrook Locksmith		Best	

## Notes:

- 120VAC is required at the head of the door for all barrier free door operators, 15A dedicated circuit. Wall/Frame must be reinforced for automatic operator mounting, all conduit and back boxes for actuators, emergency call kits, and washroom locking kits with pull cords are to be provided by the electrical contractor.
- Electrician to confirm wire locations with auto door operator supplier prior to pulling wires.

-----End of Heading-----





Heading# 26

Opening Information					
Opening Type:	Single	Opening Size:	1219 x 2135 x 45	STC Rating	None
Door Material:	SCWD	Frame Material:	HMF	Fire Rating	None

1	Total Openings							
1	Door#	K3E27	Location:	CORRIDOR 01	To	1 - BED SUITE K3E 27	Handing:	LH

By Hardware Supplier					
1	Continuous Hinge	SL24HD x 2110 x TIPIT	628 / US28 / Clear Anodized	Select	
1	Passage Set	LV9010-03B	630 / US32D / Satin Stainless Steel	Schlage	
1	Electric Strike	1500C	630 / US32D / Satin Stainless Steel	HES	
1	Overhead Stop	106S	630 / US32D / Satin Stainless Steel	Glynn Johnson	
1	Armour Plate	K10F 864 x 1150	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Mop Plate	K10F 125 x 1150 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Edge Guard	K38 x 2135 (cutout for latch)	630 / US32D / Satin Stainless Steel	Standard Metal	
2	Half Frame Guard	K51 x 1219	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Gasketing	W-66 x 5600	Black	KN Crowder	
1	Door Sweep	W-24S x 1219	628 / US28 / Clear Anodized	KN Crowder	
By Automatic Operator Supplier					
1	Auto Operator	BESAM SW200i – PULL SIDE MOUNT	628 / US28 / Clear Anodized	Besam	

2	Column Push Plate Actuator	CM-7536SS/4	630 / US32D / Satin Stainless Steel	Camden	
2	Presence Sensor	OA-Edge1T	Black	BEA	

## Notes:

- 120VAC is required at the head of the door for all barrier free door operators, 15A dedicated circuit. Wall/Frame must be reinforced for automatic operator mounting, all conduit and back boxes for actuators, emergency call kits, and washroom locking kits with pull cords are to be provided by the electrical contractor.













-----End of Heading-----





Heading# 27

Opening Information					
Opening Type:	Single	Opening Size:	1219 x 2135 x 45	STC Rating	None
Door Material:	SCWD	Frame Material:	HMF	Fire Rating	None

1	Total Openings							
1	Door#	K3E27A	Location:	1 - BED SUITE K3E 12	To	PATIENT W/C K3E 27A	Handing:	LH

By Hardware Supplier					
1	Continuous Hinge	SL24HD x 2110 x TIPIT	628 / US28 / Clear Anodized	Select	
1	Storeroom Lockset	LV9080-03B	630 / US32D / Satin Stainless Steel	Schlage	
1	Electric Strike	1500C	630 / US32D / Satin Stainless Steel	HES	
1	Overhead Stop	106S	630 / US32D / Satin Stainless Steel	Glynn Johnson	
1	Armour Plate	K10F 864 x 1159 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Mop Plate	K10F 125 x 1170 Tape	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Edge Guard	K38 x 2135 (cutout for latch)	630 / US32D / Satin Stainless Steel	Standard Metal	
2	Half Frame Guard	K51 x 1219	630 / US32D / Satin Stainless Steel	Standard Metal	
1	Gasketing	W-66 x 5600	Black	KN Crowder	
1	Door Sweep	W-24S x 1219	628 / US28 / Clear Anodized	KN Crowder	
By Automatic Operator Supplier					
1	Auto Operator	BESAM SW200i – PULL SIDE MOUNT	628 / US28 / Clear Anodized	Besam	
1	Column Push to Lock Kit	CX-WC17	628 / US28 / Clear Anodized	Camden	

1	Logic Relay	CX-33		Camden	
2	Presence Sensor	OA-Edge1T	Black	BEA	
By Owner					
1	Permanent Core	Best Coremax SFIC by Sunnybrook Locksmith		Best	

Notes:

- 120VAC is required at the head of the door for all barrier free door operators, 15A dedicated circuit. Wall/Frame must be reinforced for automatic operator mounting, all conduit and back boxes for actuators, emergency call kits, and washroom locking kits with pull cords are to be provided by the electrical contractor.

.....End of Heading.....

END OF SCHEDULE

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## **PART 1      GENERAL**

### **1.1      GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.
- 1.1.2 Contractor is solely responsible for dividing the Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of the Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2      SUMMARY**

- 1.2.1 Provide labour, materials, Products, equipment and services to complete the general requirements for glass and glazing work specified herein.
- 1.2.2 Related Requirements: Specifications throughout all Divisions of the Project shall be read as a whole, and may be directly applicable to this Section. Related requirements provided below are for convenience purposes only:
  - 1.2.2.1 Section 08 81 26 – Interior Glass and Glazing Requirements

### **1.3      REFERENCES**

- 1.3.1 Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply.

### **1.4      PREINSTALLATION MEETINGS**

- 1.4.1 Project Meetings, generally: in accordance with Section 01 31 19, Project Meetings.
- 1.4.2 Pre-installation Meetings: Schedule and hold a pre-installation meeting at the Project site at least one week before beginning work on this Section to coordinate activities with related Subcontractors.
  - 1.4.2.1 Required Attendance: Subcontractor performing work of this Section, representatives from manufacturers and fabricators involved in or affected by installation.
  - 1.4.2.2 Notification: Notify Consultant and Owner of scheduled meeting dates in advance; minimum 72 hour notice required.
  - 1.4.2.3 Agenda:
    - .1 Review progress of related construction activities and preparations for particular activity under consideration.
    - .2 Make note of required sequencing and coordination with materials and activities that have preceded or will follow.



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- 1.4.2.4 Reporting: Record significant discussions, agreements, and disagreements, including required corrective measures and actions.
- 1.4.2.5 Distribution: Distribute minutes of the meeting to each party present and to other parties requiring information not more than 72 hours after meeting.

## **1.5 SUBMITTALS**

- 1.5.1 Submittals, generally: in accordance with Section 01 33 00, Submittal Procedures.
- 1.5.2 Product Data: Submit manufacturer's product characteristics, catalogue cuts, installation instructions and other relevant information for each material and product used for general requirements for glass and glazing work specified in this Section.
- 1.5.3 Shop Drawings: Submit Shop Drawings indicating material layouts, details of construction, connections, and relationship with adjacent construction. As a minimum indicate following:
  - 1.5.3.1 Include plans, elevations, sections and details as applicable.
  - 1.5.3.2 Indicate field-measured dimensions on Shop Drawings.
- 1.5.4 Delegated Design Submittals:
  - 1.5.4.1 Engineering design completion of general requirements for glass and glazing work is delegated to Contractor based on structural design criteria indicated in Contract Documents.
  - 1.5.4.2 Submit Shop Drawings for work of this Section that bear the stamp of a Professional Engineer registered in Province of Ontario.
  - 1.5.4.3 Submit copy of structural calculations upon request by Consultant.
- 1.5.5 Embodied Carbon / Environmental Product Declarations (EPDs): When available, submit product-specific or industry-wide EPDs conforming to ISO 14025 or other recognized environmental Product declaration framework meeting following criteria:
  - 1.5.5.1 EPD Scope: Must cover Cradle-to-Gate (A1 to A3) as a minimum.
  - 1.5.5.2 EPD Impact Categories: Must report Global Warming Potential (GWP) in form of unit of kgCO<sub>2</sub>e/declared unit as a minimum.
  - 1.5.5.3 Product Options: Give preference to Products with compliant documentation when choice is at Contractor's option.
- 1.5.6 Material Ingredient Disclosure: When available, submit documentation disclosing chemical inventory of materials to at least 0.1% (1000ppm) meeting following criteria:
  - 1.5.6.1 Standard: Health Product Declaration (HPD) Open Standard, Cradle to Cradle v2 (Basic level) or Cradle to Cradle v3 (Bronze level), International Living Future Institute (ILFI) Declare, or other approved material ingredient declaration framework.
  - 1.5.6.2 Product Options: Give preference to Products with compliant documentation when choice is at Contractor's option.

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- 1.5.7 Low-Emitting Materials: For applicable Products specified or used for activities of this Section (i.e., site-applied coatings, adhesives, and sealants), submit certifications from third-party organizations indicating compliance with following:
  - 1.5.7.1 VOC Emissions: California Department of Public Health (CDPH) Standard Method v1.2–2017, using applicable exposure scenario.
  - 1.5.7.2 VOC Content: SCAQMD Rule 1113 (for paints and coatings) and SCAQMD Rule 1168 (for adhesives and sealants).

## **1.6 CLOSEOUT SUBMITTALS**

- 1.6.1 Closeout Submittals, generally: in accordance with Section 01 78 00, Closeout Submittals.
- 1.6.2 Operating and Maintenance Data: Submit care and maintenance instructions for general requirements for glass and glazing to be included in building operation and maintenance manual.
- 1.6.3 Warranty Documentation: Submit copy of extended warranties specified in this Section.

## **1.7 QUALITY ASSURANCE**

- 1.7.1 Manufacturer Qualifications: Provide Products for work of this Section by manufacturer with at least 10 years' experience manufacturing such materials.
- 1.7.2 Installer Qualifications: Engage an entity with at least five years' experience installing, erecting, or assembling work similar in material, design, and extent to that shown on Drawings and Schedules, and whose work has resulted in construction with a track record of successful in-service performance.
- 1.7.3 Professional Engineer's Qualifications: Employ Professional Engineer licensed to practice in Province of Ontario who carries professional liability insurance and has at least five years' experience providing engineering services of similar kind, scope, and complexity.
  - 1.7.3.1 Professional Engineer's Responsibility:
    - .1 production and review of Shop Drawings,
    - .2 design and certification of general requirements for glass and glazing, including attachments for building construction, in accordance with applicable codes and regulations,
    - .3 stamping and signing of each Shop Drawing and associated calculations
- 1.7.4 Single Source Responsibility: Obtain primary materials for this Section from a single source by a single manufacturer, and secondary materials from sources recommended by manufacturers of primary materials.
- 1.7.5 Mock-Ups / First Installation Review: Construct mock-ups to verify selections made under submittals, demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
  - 1.7.5.1 Location: In-situ (i.e. first installation), as directed on site by Consultant.

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- 1.7.5.2 Purpose: To set benchmarks for installation and to judge subsequent work. Maintain Mock-ups during construction in undisturbed condition.
- 1.7.5.3 Reviewed mock-ups: May become part of the completed work if undisturbed at the time of Substantial Performance of The work, provided they are undisturbed, and comply with requirements outlined in Contract Documents.

## **1.8 DELIVERY, STORAGE AND HANDLING**

- 1.8.1 Product Requirements, generally: in accordance with Section 01 61 00, Common Product Requirements.
- 1.8.2 Deliver, store and handle glass and glazing materials in accordance with manufacturer's written instructions.
- 1.8.3 Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- 1.8.4 Store materials in off-ground, in clean, dry, well-ventilated area.
- 1.8.5 Replace defective or damaged materials with new.
- 1.8.6 Comply with insulating-glass manufacturer's written recommendations for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

## **1.9 FIELD CONDITIONS**

- 1.9.1 Environmental Restrictions: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
- 1.9.2 Field Measurements: Verify actual dimensions of construction contiguous with general requirements for glass and glazing by field measurements before fabrication.
- 1.9.3 Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or below 7 deg C (44 deg F).

## **1.10 WARRANTY**

- 1.10.1 Refer to Section 08 81 26 for interior glass and glazing requirements.

## **PART 2 PRODUCTS**

### **2.1 PERFORMANCE / DESIGN CRITERIA**

- 2.1.1 Glass Thickness and Strength:
  - 2.1.1.1 Unless indicated otherwise, Provide minimum 6 mm (1/4 inch) thick glass. Increase glass thicknesses as required to meet project-specific loading requirements based on engineering design.

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- 2.1.1.2 Unless otherwise indicated, Provide fully tempered glass or heat-strengthened glass, Kind FT or Kind H complying with ASTM C1048 or equivalent to CAN/CGSB 12.1-M; complying with testing requirements in ANSI Z97.1, Class A and 16 CFR 1201 for Category II materials. Annealed glass used without heat-strengthening is not acceptable.
- .1 Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated on Drawings and Schedules or in the following applications:
    - .1 glass units with ceramic frit and base dimensions greater than 2134 mm (84 inch),
    - .2 clear 13 mm (1/2 inch) thick glass with base dimensions greater than 2134 mm (84 inch),
    - .3 other configurations with base dimensions > 2440 mm (96 inch).
  - .2 Visual Distortion: Ensure glass is tempered by the horizontal toughening process only and conforms to the following roll wave factor (RW) limits measured in accordance with ASTM C1652 requirements:
    - .1 Roller Wave Distortion Tolerance: Maximum peak-to-valley tolerance of 0.08 mm (0.03 inch) in central area of glass and 0.20 mm (0.008 inch) within 292 mm (11.5 inch) of a leading or trailing edge
    - .2 Maximum bow and warp: 1/32" per lineal foot
  - .3 Heat-Soaking: Provide in-line heat soaking of tempered glass in accordance with BS EN 14179 (2 hour dwell at 290°C±10°C) for glass used in following applications:
    - .1 Where required by the Ontario Building Code (Supplementary Standard SB-13)
    - .2 Statistical heat-soaking is not acceptable.
- 2.1.1.3 Glass thicknesses and heat treatments indicated in Contract Documents are minimum requirements. Confirm glass thicknesses and heat treatments, verified by analysis and engineering design, as required to meet performance and testing requirements specified in this Section.
- 2.1.1.4 Glazing details shown are for convenience of detailing only and are to be confirmed relative to cited standards and final framing details.
- 2.1.1.5 Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other

2.1.2 Professional Engineering Design and Certification:

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- 2.1.2.1 Design glass, including comprehensive engineering analysis according to CAN/CGSB-12.20 or equivalent to ASTM E1300 by a Professional Engineer licensed to practice in the Province of Ontario, using the design criteria indicated.
- 2.1.3 Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.
- 2.1.4 All glazing within 1070 mm of the finished floor that surrounds interior and exterior openings 600 mm or more in height from the finished floor shall be designed as a guard. This glazing shall be tempered or laminated.
- 2.1.5 Glazing acting as guards from either the interior or exterior must withstand the loads specified in the Ontario Building Code, the requirements of CAN/CSA A500 and applicable loads specified in this section.
- 2.1.6 Visibility of Glazing: Unless design is specifically indicated on Drawings, provide films on all fully glazed transparent doors, sidelights and panels that are mullion-less as follows:
  - 2.1.6.1 Minimum height: 50 mm (2 inches)
  - 2.1.6.2 Extent: full width of the door, sidelight or panel.
  - 2.1.6.3 Placement: between 1350 mm (53 inches) and 1500 mm (60 inches) above the floor. Provide consistent placement height throughout project.
- 2.1.7 VOC Content and Emissions:
  - 2.1.7.1 VOC Emissions: For applicable items in this Section, comply with CDPH Standard Method v1.2–2017 (CA Spec 01350) and ensure products are certified per UL 2818, SCS Global Gold, or equivalent.
  - 2.1.7.2 VOC Content Requirements: Wet-applied materials used in scope of this Section must conform to the following:
    - .1 Paints and Coatings: SCAQMD Rule 1113 or CARB SCM.
    - .2 Adhesives and Sealants: SCAQMD Rule 1168.
    - .3 Methylene chloride and perchloroethylene must not be intentionally added in paints, coatings, adhesives, or sealants.
  - 2.1.7.3 Composite Wood (if applicable): must be ULEF or NAF type per CARB ATCM. Do not adhesives that contain urea-formaldehyde.

## **2.2 BASIC GLASS MATERIALS**

- 2.2.1 Tempered Glass: ASTM C1048 Type I; Quality-Q3; Class I (clear); Kind FT or equivalent to CAN/CGSB-12.1. Perform heat strengthening using horizontal tong free method; surface compression not less than 69 MPa (10,000 psi). Glazing must comply with testing requirements in 16 CFR 1201 for Category II materials.
- 2.2.2 Heat-Strengthened Glass: ASTM C1048 Type I; Quality-Q3; Class I (clear) unless otherwise indicated; Kind HS or equivalent to CAN/CGSB-12.1. Perform heat strengthening using horizontal tong free method; surface compression

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between 24.1 MPa (3,500 psi) and 51.7 MPa (7,500 psi), but preferably not more than 34.5 MPa (5,000 psi) .

- 2.2.3 Fire-Rated Glass: to CAN/ULC S104 for door assemblies and CAN/ULC S106 for window assemblies.

2.2.3.1 Film-Faced Ceramic Glazing: Clear, ceramic flat glass; 5-mm (3/16-inch) nominal thickness; faced on one surface with a clear glazing film; complying with testing requirements in 16 CFR 1201 for Category II materials (safety glazing).

2.2.3.2 Laminated Ceramic Glazing: Laminated glass made from 2 plies of clear, ceramic flat glass; 8-mm (5/16-inch) total nominal thickness; complying with testing requirements in 16 CFR 1201 for Category II materials (safety glazing).

2.2.3.3 Fire-Resistive Glass: Laminated glass made from multiple plies of uncoated, clear glass; with intumescent interlayers or fully transparent, heat-absorbing gel; complying with testing requirements in 16 CFR 1201 for Category II materials (safety glazing).

2.2.3.4 Wire Glass: Not permitted.

- 2.2.4 Mirrors : ASTM C1503, or equivalent to CAN/CGSB-12.5; manufactured using copper-free, low-lead mirror coating process. Provide Mirror Select Quality; annealed glass with film backing as specified.

## **2.3 GLAZING GASKETS**

- 2.3.1 Dense Compression Gaskets (aluminum framing): Molded or extruded gaskets of profile and hardness required to maintain watertight seal, made from one of the following:

2.3.1.1 EPDM complying with ASTM C864.

2.3.1.2 Silicone complying with ASTM C1115.

2.3.1.3 Acceptable Products: "VISIONstrip" by Tremco or approved equivalent.

- 2.3.2 Soft Compression Gaskets: Extruded or molded, closed-cell, integral-skinned EPDM or silicone gaskets complying with ASTM C509, Type II, black; of profile and hardness required to maintain watertight seal.

2.3.2.1 Application: Use where soft compression gaskets will be compressed by inserting dense compression gaskets on opposite side of glazing or pressure applied by means of pressure-glazing stops on opposite side of glazing.

- 2.3.3 At fire-rated glazed doors and partitions, use similar sized fire-rated silicone as recommended by fire-rated glass manufacturer and identical to Product used in test assembly to obtain rating.

## **2.4 GLAZING SEALANTS**

- 2.4.1 General:

2.4.1.1 Compatibility: Provide glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, and glazing channel

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- substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
- 2.4.1.2 Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated on Drawings and Schedules and for conditions existing at time of installation.
- 2.4.1.3 Sealants used inside the weatherproofing system shall comply 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."
- 2.4.1.4 Colours of Exposed Glazing Sealants: As selected by Consultant from manufacturer's full range.
- 2.4.2 Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C920, Type S, Grade NS, Class 50, Use NT.
- 2.4.2.1 Acceptable Products:
- .1 "DOWSIL 795 or DOWSIL 995" by Dow Chemical of Canada ULC
  - .2 "SilGlaze II SCS2800 or SilPruf NB SCS9000 or SilPruf SCS2000 or UltraPruf II SCS2900" by GE Advanced Materials - Silicones
  - .3 "864" or "895" or "898" by Pecora Corporation
  - .4 "SikaSil-C995" by Sika Corporation, Construction Products Division
  - .5 "Spectrem 2" or "Spectrem 3" by Tremco Incorporated
- 2.4.2.2 Applications: Interior structural glazing applications.
- 2.4.3 Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C920, Type S, Grade NS, Class 25, Use NT.
- 2.4.3.1 Acceptable Products:
- .1 "Dowsil 799" by Dow Chemical of Canada ULC
  - .2 "UltraGlaze SSG4000" or "UltraGlaze SSG4000AC" by GE Advanced Materials - Silicones
  - .3 "Tremsil 200" by Tremco Incorporated
- 2.4.3.2 Applications: Non-structural sealing for butt-glazing in interior applications.
- 2.4.4 Glazing Sealants for Fire-Rated Glazing Acceptable Products: Products that are approved by testing agencies that listed and labeled fire-resistant glazing products with which they are used for applications and fire-protection ratings indicated on Drawings and Schedules.

## **2.5 GLAZING TAPES**

- 2.5.1 Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous

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surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C1281 and AAMA 800 for products indicated below:

- 2.5.1.1 AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
- 2.5.1.2 AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- 2.5.1.3 Acceptable Products: "POLYshim II Tape" by Tremco or approved equivalent.

## **2.6 MISCELLANEOUS GLAZING MATERIALS**

- 2.6.1 General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated on Drawings and Schedules, and with a proven record of compatibility with surfaces contacted in installation.
- 2.6.2 Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- 2.6.3 Setting Blocks: Elastomeric EPDM material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- 2.6.4 Spacers: Elastomeric EPDM blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated on Drawings and Schedules.
- 2.6.5 Edge Blocks: Elastomeric EPDM material of hardness needed to limit glass lateral movement (side walking).
- 2.6.6 Cylindrical Glazing Sealant Backing: ASTM C1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.
- 2.6.7 Perimeter Insulation for Fire-Resistive Glazing: Product that is approved by testing agency that listed and labeled fire-resistant glazing product with which it is used for application and fire-protection rating indicated on Drawings and Schedules.

## **2.7 FABRICATION**

- 2.7.1 General Glass Fabrication Requirements: ASTM C1036, Type I, Quality-Q3, Class I (clear) or equivalent to CAN/CGSB-12.2.
- 2.7.2 Fabricate glazing units in sizes required to fit openings indicated on Drawings and Schedules for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.
- 2.7.3 Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.
- 2.7.4 Grind smooth and polish exposed glass edges and corners.



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## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- 3.1.1 Verify actual site conditions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.
- 3.1.2 Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:
  - 3.1.2.1 Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
  - 3.1.2.2 Presence and functioning of weep systems.
  - 3.1.2.3 Minimum required face and edge clearances.
  - 3.1.2.4 Effective sealing between joints of glass-framing members.
- 3.1.3 Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 PREPARATION**

- 3.2.1 Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.
- 3.2.2 Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that will leave visible marks in the completed work.

### **3.3 INSTALLATION**

- 3.3.1 Installation, generally: Install work of this Section in strict accordance with manufacturer's written installation instructions and reviewed Shop Drawings. Supplement manufacturer's installation instructions with additional installation requirements specified in this Section to produce specified work results.

### **3.4 GLAZING**

- 3.4.1 Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated on Drawings and Schedules, including those in referenced glazing publications.
- 3.4.2 Adjust glazing channel dimensions as required by Project conditions during installation to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.
- 3.4.3 Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.

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- 3.4.4 Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- 3.4.5 Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- 3.4.6 Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- 3.4.7 Provide spacers for glass lites where length plus width is larger than 1270 mm (50 inches).
  - 3.4.7.1 Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
  - 3.4.7.2 Provide 3-mm (1/8-inch) minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- 3.4.8 Provide edge blocking where indicated on Drawings and Schedules or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
- 3.4.9 Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- 3.4.10 Set glass lites with proper orientation so that coatings face exterior or interior as specified.
- 3.4.11 Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- 3.4.12 Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

### **3.5 TAPE GLAZING**

- 3.5.1 Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- 3.5.2 Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- 3.5.3 Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.
- 3.5.4 Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

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- 3.5.5 Do not remove release paper from tape until right before each glazing unit is installed.
- 3.5.6 Apply heel bead of elastomeric sealant.
- 3.5.7 Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- 3.5.8 Apply cap bead of elastomeric sealant over exposed edge of tape.

### **3.6 GASKET GLAZING (DRY)**

- 3.6.1 Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- 3.6.2 Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- 3.6.3 Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- 3.6.4 Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- 3.6.5 Install gaskets so they protrude past face of glazing stops.

### **3.7 SEALANT GLAZING (WET)**

- 3.7.1 Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- 3.7.2 Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- 3.7.3 Tool exposed surfaces of sealants to provide a substantial wash away from glass.

### **3.8 PROTECTION**

- 3.8.1 Protect glass and glazing from damage, soiling and contaminating substances resulting from construction activities or caused by work of other trades.

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- 3.8.2 Where soiling or spills have occurred, remove spills and soiling from adjacent surfaces using cleaning procedures recommended in writing by affected material's manufacturer. Do not use materials or process that can damage finishes, surfaces, or construction.
- 3.8.3 Promptly replace glass and glazing work damaged during construction that cannot be satisfactorily repaired.

### **3.9 CLEANING AND WASTE MANAGEMENT**

- 3.9.1 Cleaning and Waste Management, generally: in accordance with Section 01 74 00, Cleaning and Waste Management.
- 3.9.2 Cleaning: Maintain clean construction area at the end of each day. When activities of this Section are complete, remove materials, tools, equipment and rubbish.
- 3.9.3 Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Performance of the Work. Wash glass as recommended in writing by glass manufacturer.
- 3.9.4 Waste Management and Disposal: sort waste for reuse, recycling, or disposal, as specified. Remove recycling bins and containers from site and dispose of contents at the appropriate waste disposal facilities.

**END OF SECTION**

## **PART 1 GENERAL**

### **1.1 GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.
- 1.1.2 Contractor is solely responsible for dividing the Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of the Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2 SUMMARY**

- 1.2.1 Provide labour, materials, Products, equipment and services to complete the interior glass and glazing work specified herein. This includes, but is not necessarily limited, to:
  - 1.2.1.1 Glazing for interior applications including, but not limited to:
    - .1 swing doors, borrowed lites and screens.
    - .2 sliding doors, manual and automatic.
    - .3 architectural woodwork.
  - 1.2.1.2 Auxiliary materials required for a complete installation.
- 1.2.2 Related Requirements: Specifications throughout all Divisions of the Project shall be read as a whole, and may be directly applicable to this Section. Related requirements provided below are for convenience purposes only:
  - 1.2.2.1 Section 08 80 05 – General Requirements for Glass and Glazing

### **1.3 REFERENCES**

- 1.3.1 Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply. Refer to 01 42 00 - References.

### **1.4 DEFINITIONS**

- 1.4.1 Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- 1.4.2 Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C1036.
- 1.4.3 Glazing cavity: Space between lites of an air-gap unit.

### **1.5 PREINSTALLATION MEETINGS**

- 1.5.1 Project Meetings, generally: in accordance with Section 01 31 19, Project Meetings.

- 1.5.2 Pre-installation Meetings: Schedule and hold a pre-installation meeting at the Project site at least one week before beginning work on this Section to coordinate activities with related Subcontractors.
  - 1.5.2.1 Required Attendance: Subcontractor performing work of this Section, representatives from manufacturers and fabricators involved in or affected by installation.
  - 1.5.2.2 Notification: Notify Consultant and Owner of scheduled meeting dates in advance; minimum 72 hour notice required.
  - 1.5.2.3 Agenda:
    - .1 Review progress of related construction activities and preparations for particular activity under consideration.
    - .2 Make note of required sequencing and coordination with materials and activities that have preceded or will follow.
  - 1.5.2.4 Reporting: Record significant discussions, agreements, and disagreements, including required corrective measures and actions.
  - 1.5.2.5 Distribution: Distribute minutes of the meeting to each party present and to other parties requiring information not more than 72 hours after meeting.

## **1.6 SUBMITTALS**

- 1.6.1 Submittals, generally: in accordance with Section 01 33 00, Submittal Procedures.
- 1.6.2 Product Data: Submit manufacturer's product characteristics, catalogue cuts, installation instructions and other relevant information for each material and product used for interior glass and glazing work specified in this Section.
- 1.6.3 Shop Drawings: Submit Shop Drawings indicating material layouts, details of construction, connections, and relationship with adjacent construction. As a minimum indicate following:
  - 1.6.3.1 Include plans, elevations, sections and details as applicable.
  - 1.6.3.2 Indicate field-measured dimensions on Shop Drawings.
- 1.6.4 Delegated Design Submittals:
  - 1.6.4.1 Engineering design completion of interior glass and glazing work is delegated to Contractor based on structural design criteria indicated in Contract Documents.
  - 1.6.4.2 Submit Shop Drawings for work of this Section that bear the stamp of a Professional Engineer registered in Province of Ontario.
  - 1.6.4.3 Submit copy of structural calculations upon request by Consultant.
- 1.6.5 Embodied Carbon / Environmental Product Declarations (EPDs): When available, submit product-specific or industry-wide EPDs conforming to ISO 14025 or other recognized environmental Product declaration framework meeting following criteria:
  - 1.6.5.1 EPD Scope: Must cover Cradle-to-Gate (A1 to A3) as a minimum.
  - 1.6.5.2 EPD Impact Categories: Must report Global Warming Potential (GWP) in form of unit of kgCO<sub>2</sub>e/declared unit as a minimum.

- 1.6.5.3 Product Options: Give preference to Products with compliant documentation when choice is at Contractor's option.
- 1.6.6 Material Ingredient Disclosure: When available, submit documentation disclosing chemical inventory of materials to at least 0.1% (1000ppm) meeting following criteria:
  - 1.6.6.1 Standard: Health Product Declaration (HPD) Open Standard, Cradle to Cradle v2 (Basic level) or Cradle to Cradle v3 (Bronze level), International Living Future Institute (ILFI) Declare, or other approved material ingredient declaration framework.
  - 1.6.6.2 Product Options: Give preference to Products with compliant documentation when choice is at Contractor's option.
- 1.6.7 Low-Emitting Materials: For applicable Products specified or used for activities of this Section (i.e., site-applied coatings, adhesives, and sealants), submit certifications from third-party organizations indicating compliance with following:
  - 1.6.7.1 VOC Emissions: California Department of Public Health (CDPH) Standard Method v1.2–2017, using applicable exposure scenario.
  - 1.6.7.2 VOC Content: SCAQMD Rule 1113 (for paints and coatings) and SCAQMD Rule 1168 (for adhesives and sealants).
- 1.6.8 Samples: Submit selection and verification samples for Products requiring colour, texture, or design selection. Submit manufacturer's list of finishes or colour swatches for Consultant's selection.
  - 1.6.8.1 As a minimum submit samples of the following:
    - .1 Specialty and decorative glazing materials.
- 1.6.9 Glazing Schedule: Submit glazing schedule list of glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings and Schedules.

## **1.7 CLOSEOUT SUBMITTALS**

- 1.7.1 Closeout Submittals, generally: in accordance with Section 01 78 00, Closeout Submittals.
- 1.7.2 Operating and Maintenance Data: Submit care and maintenance instructions for interior glass and glazing to be included in building operation and maintenance manual.
- 1.7.3 Warranty Documentation: Submit copy of extended warranties specified in this Section.

## **1.8 QUALITY ASSURANCE**

- 1.8.1 Manufacturer Qualifications: Provide Products for work of this Section by manufacturer with at least 10 years' experience manufacturing such materials.
- 1.8.2 Installer Qualifications: Engage an entity with at least five years' experience installing, erecting, or assembling work similar in material, design, and extent to that shown on Drawings and Schedules, and whose work has resulted in construction with a track record of successful in-service performance.

- 1.8.3 Professional Engineer's Qualifications: Employ Professional Engineer licensed to practice in Province of Ontario who carries professional liability insurance and has at least five years' experience providing engineering services of similar kind, scope, and complexity.
- 1.8.3.1 Professional Engineer's Responsibility:
- .1 production and review of Shop Drawings,
  - .2 design and certification of interior glass and glazing, including attachments for building construction, in accordance with applicable codes and regulations,
  - .3 stamping and signing of each Shop Drawing and associated calculations
- 1.8.4 Single Source Responsibility: Obtain primary materials for this Section from a single source by a single manufacturer, and secondary materials from sources recommended by manufacturers of primary materials.
- 1.8.5 Mock-Ups / First Installation Review: Construct mock-ups to verify selections made under submittals, demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
- 1.8.5.1 Location: In-situ (i.e. first installation), as directed on site by Consultant.
- 1.8.5.2 Purpose: To set benchmarks for installation and to judge subsequent work. Maintain Mock-ups during construction in undisturbed condition.
- 1.8.5.3 Reviewed mock-ups: May become part of the completed work if undisturbed at the time of Substantial Performance of The work, provided they are undisturbed, and comply with requirements outlined in Contract Documents.

## **1.9 DELIVERY, STORAGE AND HANDLING**

- 1.9.1 Product Requirements, generally: in accordance with Section 01 61 00, Common Product Requirements.
- 1.9.2 Deliver, store and handle interior glass and glazing materials in accordance with manufacturer's written instructions.
- 1.9.3 Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- 1.9.4 Store materials in off-ground, in clean, dry, well-ventilated area.
- 1.9.5 Replace defective or damaged materials with new.

## **1.10 FIELD CONDITIONS**

- 1.10.1 Environmental Restrictions: Do not deliver or install interior glass and glazing until building is enclosed, wet work is complete, and HVAC system is operational and will maintain temperature and relative humidity levels equal to occupancy levels for remainder of construction period.
- 1.10.2 Field Measurements: Verify actual dimensions of construction contiguous with interior glass and glazing by field measurements before fabrication.



- 1.10.3 Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or below 7 deg C (44 deg F).

## **1.11 WARRANTY**

- 1.11.1 Extended warranty: Submit for Owner's review and acceptance, manufacturer's extended warranty in which manufacturer commits to repair or replace components of interior glass and glazing that fail within specified warranty period. Manufacturer's extended warranty is in addition to, and does not supersede, any other rights that Owner may have under Contract Documents.

- 1.11.1.1 Warranty Period: Not less than 5 years from date of Substantial Performance of The work.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURERS**

- 2.1.1 Provided requirements of Contract Documents are satisfied, the following manufacturers may supply Products for work this Section:

2.1.1.1 Fire-rated Glazing:

- .1 Nippon Electric Glass Co., Ltd. / Technical Glass Products (TGP)
- .2 Pilkington Group Limited / Technical Glass Products (TGP)
- .3 Safti First
- .4 Schott North America, Inc.
- .5 Vetrotech Saint-Gobain

2.1.1.2 Glazing Sealant:

- .1 Dow Chemical of Canada ULC
- .2 GE Advanced Materials – Silicones
- .3 Pecora Corporation
- .4 Sika Corporation, Construction Products Division
- .5 Tremco Incorporated

- 2.1.2 Substitution Limitations: In accordance with requirements of Section 01 25 00, Substitution Procedures.

### **2.2 PERFORMANCE / DESIGN CRITERIA**

- 2.2.1 Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.

2.2.2 VOC Content and Emissions:

- 2.2.2.1 VOC Emissions: For applicable items in this Section, comply with CDPH Standard Method v1.2–2017 (CA Spec 01350) and ensure products are certified per UL 2818, SCS Global Gold, or equivalent.

- 2.2.2.2 VOC Content Requirements: Wet-applied materials used in scope of this Section must conform to the following:

- .1 Paints and Coatings: SCAQMD Rule 1113 or CARB SCM.
  - .2 Adhesives and Sealants: SCAQMD Rule 1168.
  - .3 Methylene chloride and perchloroethylene must not be intentionally added in paints, coatings, adhesives, or sealants.
- 2.2.2.3 Composite Wood (if applicable): must be ULEF or NAF type per CARB ATCM. Do not adhesives that contain urea-formaldehyde.

## 2.3 GLASS MATERIALS

- 2.3.1 Refer to Section 08 80 05.

## 2.4 TEMPERED GLASS (GL-1)

- 2.4.1 ASTM C1048 Type I; Quality-Q3; Class I (clear); Kind FT or equivalent to CAN/CGSB-12.1. Perform heat strengthening using horizontal tong free method; surface compression not less than 69 MPa (10,000 psi). Glazing must comply with testing requirements in 16 CFR 1201 for Category II materials.

## 2.5 FIRE-RATED GLASS (GL-30)

- 2.5.1 Following types are acceptable:

2.5.1.1 Fire-Rated Ceramic Glazing:

- .1 Film-Faced Type: Clear, ceramic flat glass; 5-mm (3/16-inch) nominal thickness; faced on one surface with a clear glazing film; complying with testing requirements in 16 CFR 1201 for Category II materials.
  - .1 Acceptable Products:
    - .1 "FireLite NT" by Nippon Electric Glass Co., Ltd. (distributed by Technical Glass Products)
    - .2 "Pyran Platinum F" by Schott North America, Inc.
    - .3 "Keralite F" by Vetrotech Saint-Gobain
  - .2 Laminated Type: Laminated glass made from 2 plies of clear, ceramic flat glass; 8-mm (5/16-inch) total nominal thickness; complying with testing requirements in 16 CFR 1201 for Category II materials.
    - .1 Acceptable Products:
      - .1 "FireLite Plus" by Nippon Electric Glass Co., Ltd. (distributed by Technical Glass Products)
      - .2 "Pyran Platinum L" by Schott North America, Inc.
      - .3 "Keralite L" by Vetrotech Saint-Gobain

- 2.5.2 Fire-rating: as indicated on Drawings and Schedules.

## 2.6 GLAZING MATERIALS AND ACCESSORIES

- 2.6.1 Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated on Drawings and Schedules, and with a proven record of compatibility with surfaces contacted in installation.

2.6.2 Refer to Section 08 80 05 for additional requirements.

## **2.7 FABRICATION**

2.7.1 General Glass Fabrication Requirements: ASTM C1036, Type I, Quality-Q3, Class I (clear) or equivalent to CAN/CGSB-12.2.

2.7.2 Fabricate glazing units in sizes required to fit openings indicated on Drawings and Schedules for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

2.7.3 Glazing Film: Apply glazing squarely aligned to glass edges, uniformly smooth, and free from tears, air bubbles, wrinkles, and rough edges in pattern indicated on reviewed Shop Drawings and with graphic images as indicated to the back face of clean glass, according to manufacturer's written instructions, including surface preparation and application temperature limitations.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

3.1.1 Verify actual site conditions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.

3.1.2 Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:

- 3.1.2.1 Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
- 3.1.2.2 Presence and functioning of weep systems.
- 3.1.2.3 Minimum required face and edge clearances.
- 3.1.2.4 Effective sealing between joints of glass-framing members.

### **3.2 PREPARATION**

3.2.1 Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

3.2.2 Examine glazing units to locate interior surfaces. Label or mark units as needed so that interior and interior surfaces are readily identifiable. Do not use materials that will leave visible marks in the completed work.

### **3.3 INSTALLATION**

3.3.1 Installation, generally: Install work of this Section in strict accordance with manufacturer's written installation instructions and reviewed Shop Drawings. Supplement manufacturer's installation instructions with additional installation requirements specified in this Section to produce specified work results.

- 3.3.2 Refer to Section 08 80 05 as supplemented by requirements specified in this Section.

### **3.4 FILM APPLICATION**

- 3.4.1 Install film in accordance with manufacturer's instructions. Cut film edges neatly and square at a uniform distance of 3 mm (1/8 inch) to 1.5 mm (1/16 inch) of glazing sealants.
- 3.4.2 Apply slip solution on glass and adhesive to facilitate proper positioning of film.
- 3.4.3 Apply film to glass and spray film with slip solution.
- 3.4.4 Squeegee from top to bottom of window. Spray slip solution to film and squeegee again.
- 3.4.5 Bump film edge with lint-free towel wrapped around edge of a 5-way tool.
- 3.4.6 Upon completion of application, allow 30 days for moisture from film installation to dry, and to allow film to dry with no moisture dimples when viewed under normal viewing conditions.
- 3.4.7 In exterior applications, Provide edge sealing as recommended by manufacturer.
- 3.4.8 In security applications, Install film attachment system according to manufacturer's instructions. Provide minimum bead overlap as required to ensure impact-resistance specified in this Section can be achieved.

### **3.5 PROTECTION**

- 3.5.1 Protect interior glass and glazing from damage, soiling and contaminating substances resulting from construction activities or caused by work of other trades.
- 3.5.2 Where soiling or spills have occurred, remove spills and soiling from adjacent surfaces using cleaning procedures recommended in writing by affected material's manufacturer. Do not use materials or process that can damage finishes, surfaces, or construction.
- 3.5.3 Promptly replace interior glass and glazing work damaged during construction that cannot be satisfactorily repaired.

### **3.6 CLEANING AND WASTE MANAGEMENT**

- 3.6.1 Cleaning and Waste Management, generally: in accordance with Section 01 74 00, Cleaning and Waste Management.
- 3.6.2 Cleaning: Maintain clean construction area at the end of each day. When activities of this Section are complete, remove materials, tools, equipment and rubbish.
- 3.6.3 Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Performance of the Work. Wash glass as recommended in writing by glass manufacturer.
- 3.6.4 Waste Management and Disposal: sort waste for reuse, recycling, or disposal, as specified. Remove recycling bins and containers from site and dispose of contents at the appropriate waste disposal facilities.

**SHSC C2 DECANT (K3E) AND GIM DECANT (K2E)**

**PROJECT NO. HS1024-0383**

**ISSUED DATE: 2025-11-20**

**ISSUED FOR: TENDER**

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SECTION 08 81 26  
INTERIOR GLASS AND GLAZING

**END OF SECTION**

## **PART 1      GENERAL**

### **1.1      GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.

### **1.2      SUMMARY**

- 1.2.1 Applicability: This Schedule of Finishes applies to finishes in Divisions 02 to 49, as applicable. This Schedule of Finishes pertains to colors and finish specifications for visible interior materials in completed construction. The term "color" includes surface color and pattern.
- 1.2.2 Locations: Refer to the Drawings for specific locations of finishes mentioned in this Schedule.
- 1.2.3 Submittal, Quality, and Installation Requirements: For each product and finish listed in this Schedule, refer to technical specifications for submittal, quality, and installation requirements. If not specified in this Section, Schedules and Drawings indicate the specific locations where various materials are required. Materials without assigned colours in this section may be specified elsewhere. If no colour is assigned to items, a list of available colors must be submitted to Consultant for selection. Allow Consultant to choose from manufacturer's standard range.
- 1.2.4 Selection of Equivalent Colors: If a specific colour is manufacturer-specific, an alternative colour from another manufacturer may be proposed for review by Consultant. The mention of specific manufacturers and materials is not meant to limit the selection of equivalent colours from other approved manufacturers listed in relevant specification Sections. In case of discrepancies between Drawings and specifications, colours specified within Schedule of Finishes take precedence.
- 1.2.5 Related Requirements: Specifications throughout all Divisions of the Project shall be read as a whole, and may be directly applicable to this Section.

## **PART 2      PRODUCTS**

### **2.1      MATERIALS**

- 2.1.1 Refer to Schedule of Finishes appended to this Section for full description of interior design materials and selections.
- 2.1.2 This Schedule shall form part of, and shall be read in conjunction with, the Contract Documents.
- 2.1.3 Refer to Drawings for Schedules not bound with Project Manual.

**PART 3      EXECUTION**

**3.1      GENERAL INSTALLATION REQUIREMENTS**

- 3.1.1    Comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets. Install work in accordance with requirements indicated in applicable specification sections.

**END OF SECTION**

**NOTE: The application / location for the materials indicated is not limited to the list below and is to be used in conjunction with and may be supplemented by the Specifications, Schedules, and Drawings. Refer to Specifications, Schedules, and Drawings for full extent of material application and additional material types. Provide samples for verification of colour and finish.**


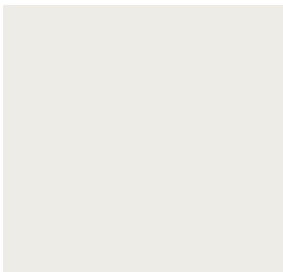
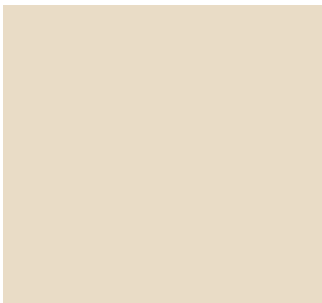
CODE	ITEM	DESCRIPTION	APPLICATION / LOCATION	SAMPLE IMAGE
<b>DIVISION 06 – WOOD, PLASTICS AND COMPOSITES</b>				
PLAM-1	Plastic Laminate	Manufacturer: Formica or approved equivalent  Colour: #346 Natural Oak  Finish: Matte		
PLAM-2	Plastic Laminate	Manufacturer: Wilsonart or approved equivalent  Colour: #8220-38 French Pear  Finish: Fine Velvet	Casework – Upper and Base Cabinets	
PLAM-3	Plastic Laminate	Manufacturer: Wilsonart or approved equivalent  Colour: #5057-18 Pearl Alloy (Premium)  Finish: Linearity	Casework –Base Cabinets	
SSF-1	Solid Surface	Manufacturer: Corian Solid Surface or approved equivalent  Colour: Antartica  Thickness: 1/2" (12mm)  Eased Edges (minimum radius)	Countertops and Worksurfaces	





**NOTE: The application / location for the materials indicated is not limited to the list below and is to be used in conjunction with and may be supplemented by the Specifications, Schedules, and Drawings. Refer to Specifications, Schedules, and Drawings for full extent of material application and additional material types. Provide samples for verification of colour and finish.**

CODE	ITEM	DESCRIPTION	APPLICATION / LOCATION	SAMPLE IMAGE
HP-1	Millwork Pull Handle  (Uppers & Lowers, Refer to the millwork elevations)	Manufacturer: Richelieu Product: Handle Pull #2102128170 Length: 185mm Projection: 35mm Finish: 170 Stainless Steel		



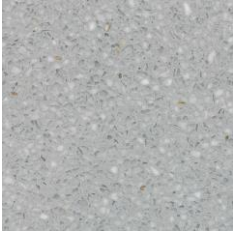
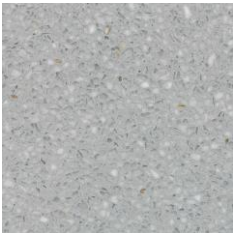
#### DIVISION 09 – FINISHES

ACT-1	Acoustic Ceiling Tile	Manufacturer: Armstrong, or Equivalent Product: Ultima Health Zone Lay-in Product Number: 1935 Size: 610 x 1219mm Colour: White Grid: Prelude XL 15/16" Exposed Tee NRC Rating: 0.70 CAC Rating: Minimum 38		
PT-1	Field Paint	Manufacturer: Sherwin Williams Product Line: 255-C1 Colour: SW 7005 Pure White Sheen: Eggshell	General Paint	
PT-3	Paint	Manufacturer: Sherwin Williams Product Line: 264 – C5 Colour: SW 6126 Navajo White (field verify colour w/ existing) Sheen: Eggshell	Door Frames  To match existing	

**NOTE: The application / location for the materials indicated is not limited to the list below and is to be used in conjunction with and may be supplemented by the Specifications, Schedules, and Drawings. Refer to Specifications, Schedules, and Drawings for full extent of material application and additional material types. Provide samples for verification of colour and finish.**

CODE	ITEM	DESCRIPTION	APPLICATION / LOCATION	SAMPLE IMAGE
PT-4	Paint	Manufacturer: Sherwin Williams  Product Line:  Colour: To match existing blue  Sheen: Semi-gloss	Doors	Match Existing
PT-5	Paint	Manufacturer: Sherwin Williams  Product Line:  Colour: To match existing adjacent colour	Doors frames	Match Existing
RSF-1	Rubber Sheet Flooring	Supplier: Mondo  Product: Harmoni  Code: HG486 Wool  Thickness: 3mm  Adhesive: EP55  Contact: <a href="mailto:fcoin@mondousa.com">fcoin@mondousa.com</a>	General Flooring	
MTE-1	Rubber Sheet Flooring	Supplier: Mondo  Product: Harmoni  Code: HG506 Sphynx (to be confirmed)  Thickness: 3mm  Adhesive: EP55  Contact: <a href="mailto:fcoin@mondousa.com">fcoin@mondousa.com</a>	Open corridor area (colour to be confirmed to match existing)	



**NOTE: The application / location for the materials indicated is not limited to the list below and is to be used in conjunction with and may be supplemented by the Specifications, Schedules, and Drawings. Refer to Specifications, Schedules, and Drawings for full extent of material application and additional material types. Provide samples for verification of colour and finish.**

CODE	ITEM	DESCRIPTION	APPLICATION / LOCATION	SAMPLE IMAGE
RB-1	Rubber Base 6" High	Manufacturer: Roppe  Product: Pinnacle  Colour: similar to #198 Ivory (match existing colour)  Standard toe with inside and outside corners	Match existing rubber base.	
ICB-1	Integral Cove Base	Supplier: Mondo  Product: Harmoni  Code: to match adjacent floor  Thickness: 3mm  Adhesive: EP55  Contact: <a href="mailto:fcoin@mondousa.com">fcoin@mondousa.com</a>	Throughout where RSF-1 and MTE-1 and MTE-2 is indicated	
ICB-2	Integral Cove Base	Manufacturer: Sika or approved equivalent  Product: Sikafloor® Terrazzo  Colour: To match new Terrazzo flooring  Grout/Topcoat: Sikafloor® Duochem-942  Height: 150mm (6")	Where TRZ-1 is seen	
TRZ-1	Thin Set Terrazzo Flooring	Manufacturer: Sika, or approved Equivalent  Product: Sikafloor® Terrazzo  Colour: To be confirmed  Grout/Topcoat: Sikafloor® Duochem-942  Thickness: 10 mm  *6" Integral Terrazzo Flash cove base; Finish and Sealer per	WR's Soiled, as per plans	


**NOTE: The application / location for the materials indicated is not limited to the list below and is to be used in conjunction with and may be supplemented by the Specifications, Schedules, and Drawings. Refer to Specifications, Schedules, and Drawings for full extent of material application and additional material types. Provide samples for verification of colour and finish.**

CODE	ITEM	DESCRIPTION	APPLICATION / LOCATION	SAMPLE IMAGE
		<p>manufacturer's specifications</p> <p>*Submit sample prior to installing is required.</p>		




#### DIVISION 10 – SPECIALTIES

CG-1	Corner Guards	<p>Manufacturer: Construction Specialties or Equivalent</p> <p>Product: Model CO-8</p> <p>Shape: 90° w/ Radius Edge</p> <p>Size: 75mm x 75mm</p> <p>Finish: No. 4 Stainless Steel Surface Mounted Method</p> <p>Height as indicated on drawings</p>	General (90°)	
SWC-1	Wall Protection	<p>Manufacturer: Construction Specialties</p> <p>Product: Rigid Acrovyn Sheet 4000</p> <p>Colour: #262 Driftwood</p> <p>Finish: Suede Texture</p> <p>Thickness: 0.040"</p> <p>Height: As per drawings</p>	Throughout	

**NOTE: The application / location for the materials indicated is not limited to the list below and is to be used in conjunction with and may be supplemented by the Specifications, Schedules, and Drawings. Refer to Specifications, Schedules, and Drawings for full extent of material application and additional material types. Provide samples for verification of colour and finish.**

CODE	ITEM	DESCRIPTION	APPLICATION / LOCATION	SAMPLE IMAGE
SWC-2	Wall Protection	<p>Manufacturer: Construction Specialties</p> <p>Product: Rigid Acrovyn Sheet 4000</p> <p>Colour: #314 Ozark</p> <p>Finish: Suede Texture</p> <p>Thickness: 0.040"</p> <p>Height: As per drawings</p>	<p>Backsplashes</p> <p>Handwash Sinks</p>	
SWC-3	Wall Protection	<p>Manufacturer: Construction Specialties</p> <p>Product: Rigid Acrovyn Sheet 4000</p> <p>Colour: #660 Sage Green (verify colour with existing)</p> <p>Finish: Suede Texture</p> <p>Thickness: 0.040"</p> <p>Height: As per drawings</p>	<p>Corridor 1, 3</p> <p>To match existing</p>	
CH-1	Coat Hooks	<p>Manufacturer: American Specialties Inc.</p> <p>Product: Single Robe Hook 10 – 7340 - S</p> <p>Finish: S – Satin #4 Stainless Steel</p>		
GRB-1	<p>Grab Bars</p> <p><b>Location: Accessible washrooms</b></p>	<p>Manufacturer: Bobrick</p> <p>Product: B-5806.99 x 24</p> <p>Finish: Satin finish with peened grip</p>		



**NOTE: The application / location for the materials indicated is not limited to the list below and is to be used in conjunction with and may be supplemented by the Specifications, Schedules, and Drawings. Refer to Specifications, Schedules, and Drawings for full extent of material application and additional material types. Provide samples for verification of colour and finish.**

CODE	ITEM	DESCRIPTION	APPLICATION / LOCATION	SAMPLE IMAGE
GRB-2	Grab Bars  <b>Location: Accessible washrooms</b>	Manufacturer: Bobrick Product: B-5898.99 90 deg 30"x30" Angle Bar Finish: Satin finish with peened grip		
GRB-3	Drop Down Grab Bar  <b>Location: Accessible washrooms</b>	Manufacturer: Bobrick Product: B-4998 Swing-Up Grab Bar Finish: Satin finish Diameter: 1-1/4" (32mm)		
MIR-1	Mirrors  <b>Location: Accessible washrooms</b>	Manufacturer: Bobrick Product: B-293 Size: 460x915 (18"x36") Tilted with stainless steel frame. In barrier free, patient, staff and public washrooms		
SLF-1	Stainless Steel Shelf  <b>Location: Washrooms</b>	Manufacturer: Frost Product: 950-4		

**NOTE: The application / location for the materials indicated is not limited to the list below and is to be used in conjunction with and may be supplemented by the Specifications, Schedules, and Drawings. Refer to Specifications, Schedules, and Drawings for full extent of material application and additional material types. Provide samples for verification of colour and finish.**

CODE	ITEM	DESCRIPTION	APPLICATION / LOCATION	SAMPLE IMAGE
PTTD-1	Paper Towel Dispenser  <b>Location: Public Spaces</b>	Manufacturer: Bobrick Code: B-359039 Product: Surface-Mounted Paper Towel Disp. Finish: Satin-Finish Stainless Steel Operation: Manual Mounting Options: Surface Mount Capacity: 300 C-fold ; 400 multifold		
SD-1	Soap Dispenser	Manufacturer: Bobrick Code: B-2111 Product: Soap Disp. Finish: Satin-Finish Stainless Steel Operation: Manual Mounting Options: Wall (surface) Mount Capacity: 1.2L		
SND-1	Sanitary Napkin Disposals  <b>Location: Washrooms</b>	Manufacturer: Bobrick Product: B-270 Public Washrooms		

**NOTE: The application / location for the materials indicated is not limited to the list below and is to be used in conjunction with and may be supplemented by the Specifications, Schedules, and Drawings. Refer to Specifications, Schedules, and Drawings for full extent of material application and additional material types. Provide samples for verification of colour and finish.**

CODE	ITEM	DESCRIPTION	APPLICATION / LOCATION	SAMPLE IMAGE
TPH-1	Surface Mounted Multi-roll Toilet Tissue Dispenser	<p>Manufacturer: Bobrick</p> <p>Code: B-2888</p> <p>Finish: Stainless Steel with satin finish</p> <p>Mounting Options: Wall Mount</p> <p>Size: 6 1/16"H x 11"W x 5 15/16"D</p>		
WB-1	<p>Magnetic Whiteboard</p> <p><b>Location:</b> <b>Physician's Workroom</b></p>	<p>Manufacturer: Architectural School Products (a.s.p.)</p> <p>Product: Elite Reveal System Magnetic Board</p> <p>Surface: Porcelain white, writing surface</p> <p>Size: 3'x3'</p>		

End of Section



## **PART 1      GENERAL**

### **1.1      GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.
- 1.1.2 Contractor is solely responsible for dividing the Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of the Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2      SUMMARY**

- 1.2.1 Provide labour, materials, Products, equipment and services to complete the gypsum board assemblies work specified herein. This includes, but is not necessarily limited, to:
  - 1.2.1.1 Interior gypsum board and framing systems.
  - 1.2.1.2 Framing for gypsum board assemblies including, but not limited to studs, channels, furring and similar components, suspended ceiling components, and concealed reinforcing.
  - 1.2.1.3 Joint treatments, trims and accessories.
  - 1.2.1.4 Auxiliary materials required for a complete installation.
- 1.2.2 Related Requirements: Specifications throughout all Divisions of the Project shall be read as a whole, and may be directly applicable to this Section. Related requirements provided below are for convenience purposes only:
  - 1.2.2.1 Section 06 10 00, Rough Carpentry.
  - 1.2.2.2 Section 07 84 10, Firestopping and Smoke Seals.
  - 1.2.2.3 Section 07 92 00, Joint Sealants.

### **1.3      REFERENCES**

- 1.3.1 Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply.

### **1.4      DEFINITIONS**

- 1.4.1 Drywall: Gypsum Board.
- 1.4.2 Textured Wall Finishes: Regular or irregular patterns typically produced by applying a mixture of joint compound and water, or proprietary texture materials to a gypsum board surface previously coated with primer.
- 1.4.3 Steel Thickness:
  - 1.4.3.1 Base Steel Thickness: Thickness of bare steel exclusive of coatings.

- 1.4.3.2 Design Thickness: Target or "nominal" thickness used to determine structural properties of the cold formed Products.
- 1.4.3.3 Minimum Thickness: Design thickness minus minimum allowable under-tolerance required by CSA S136 (95% of design thickness) or material specification; whichever is more stringent.
- 1.4.3.4 Designation Thickness: For the purposes of this specification; thicknesses provided will be minimum base steel thicknesses in accordance with CSA S136

## **1.5 ADMINISTRATIVE REQUIREMENTS**

- 1.5.1 Pre-installation Meetings: Schedule and hold a pre-installation meeting at the Project site before beginning work on this Section to coordinate activities with related Subcontractors.
  - 1.5.1.1 Notification: Where Consultant attendance is required; minimum 72 hour notice is required.
  - 1.5.1.2 Reporting: Record significant discussions, agreements, and disagreements, including required corrective measures and actions.
  - 1.5.1.3 Distribution: Distribute minutes of the meeting to each party present and to other parties requiring information not more than 72 hours after meeting.
- 1.5.2 Coordination:
  - 1.5.2.1 Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.
  - 1.5.2.2 Coordinate installation and cooperate with mechanical and electrical trades to accommodate mechanical electrical items and any other work required to be incorporated into or coordinated with ceiling and soffit systems.
  - 1.5.2.3 Coordinate work of this Section with application of firestopping and fireproofing Work to ensure assemblies provided meet requirements of authorities having jurisdiction.

## **1.6 SUBMITTALS**

- 1.6.1 Submittals, generally: in accordance with Section 01 33 00, Submittal Procedures.
- 1.6.2 Product Data: Submit manufacturer's product characteristics, catalogue cuts, installation instructions and other relevant information for each material and product used for gypsum board assemblies work specified in this Section.
- 1.6.3 Shop Drawings: Submit Shop Drawings indicating material layouts, details of construction, connections, and relationship with adjacent construction. As a minimum indicate following:
  - 1.6.3.1 Include plans, elevations, sections and details as applicable.
  - 1.6.3.2 Standard construction of assemblies,

- 1.6.3.3 Sound attenuating construction,
- 1.6.3.4 Locations of access panels,
- 1.6.3.5 Finishes and relevant details of furring,
- 1.6.4 Delegated Design Submittals:
  - 1.6.4.1 Engineering design completion of gypsum board assemblies work for all spans exceeding 3m (10 ft) is delegated to Contractor based on structural design criteria indicated in Contract Documents.
  - 1.6.4.2 Submit Shop Drawings for work of this Section that bear the stamp of a Professional Engineer registered in Province of Ontario.
  - 1.6.4.3 Submit copy of structural calculations upon request by Consultant.
- 1.6.5 Certificates: Obtain approval of electrical utility authorities having jurisdiction for support of light fixtures, by ceiling grid and supports, to satisfy requirements of electrical utility company. Adjust grid, fixing devices and support hangers as required to obtain approval.
- 1.6.6 Environmental and Material Transparency:
  - 1.6.6.1 Embodied Carbon / EPDs: When available, Submit EPDs conforming to ISO 14025 or equivalent standard; prioritize products with such documentation when choices are at Contractor's option.
  - 1.6.6.2 Material Ingredient Disclosure: When available, submit documentation identifying chemical inventories of materials to at least 0.1% (1000ppm) in accordance with HPD Open Standard, Cradle to Cradle (Basic v2/Bronze v3), ILFI Declare, or equivalent standard; products with such documentation when choices are at Contractor's option.
- 1.6.7 Low-Emitting Materials: For applicable Products specified or used for activities of this Section (i.e., site-applied coatings, adhesives, and sealants), submit certifications from third-party organizations indicating compliance with following:
  - 1.6.7.1 VOC Emissions: California Department of Public Health (CDPH) Standard Method v1.2–2017, using applicable exposure scenario.
  - 1.6.7.2 VOC Content: SCAQMD Rule 1113 (for paints and coatings) and SCAQMD Rule 1168 (for adhesives and sealants).
- 1.6.8 Samples: Submit selection and verification samples for gypsum board assemblies work requiring colour, texture, or design selection. Submit manufacturer's list of finishes or colour swatches for Consultant's selection.
  - 1.6.8.1 As a minimum submit samples of the following:
    - .1 Each trim accessory minimum 300 mm (12 inch) long.

## **1.7 CLOSEOUT SUBMITTALS**

- 1.7.1 Operating and Maintenance Data: Submit care and maintenance instructions for gypsum board assemblies to be included in building operation and maintenance manual.
- 1.7.2 Warranty Documentation: Submit copy of extended warranties specified in this Section.

## **1.8 QUALITY ASSURANCE**

- 1.8.1 Manufacturer Qualifications: Provide Products for work of this Section by manufacturer with at least 10 years' experience manufacturing such materials.
- 1.8.2 Steel Fabricator's Qualifications: Provide steel framing members from fabricator who can produce Products to meet requirements specified in this Section, and who is a member in good standing with the Canadian Sheet Steel Institute (CSSBI) or similar organization that provides verifiable code compliance program (e.g. Steel Framing Industry Association).
- 1.8.3 Installer Qualifications: Engage an entity with sufficient experience installing, erecting, or assembling work similar in material, design, and extent to that shown on Drawings and Schedules, and whose work has resulted in construction with a track record of successful in-service performance.
- 1.8.4 Professional Engineer's Qualifications: Employ Professional Engineer licensed to practice in Province of Ontario who carries professional liability insurance and has at least five years' experience providing engineering services of similar kind, scope, and complexity.
  - 1.8.4.1 Professional Engineer's Responsibility:
    - .1 production and review of Shop Drawings,
    - .2 design and certification of gypsum board assemblies, including attachments for building construction, in accordance with applicable codes and regulations,
    - .3 stamping and signing of each Shop Drawing and associated calculations
- 1.8.5 Single Source Responsibility: Obtain primary materials for this Section from a single source by a single manufacturer, and secondary materials from sources recommended by manufacturers of primary materials.
- 1.8.6 First Installation Review: Construct sample installations to verify selections made under submittals, demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
  - 1.8.6.1 Extent: Level 5 gypsum board finish for use in exposed locations.
    - .1 Apply or install final decoration indicated, including painting and wallcoverings, on exposed surfaces for review of mockups.
    - .2 Simulate finished lighting conditions for review of mockups.
  - 1.8.6.2 Location: In-situ (i.e. first installation), as directed on site by Consultant.
  - 1.8.6.3 Purpose: To set benchmarks for installation and to judge subsequent work. Maintain such sample installations during construction in undisturbed condition.
  - 1.8.6.4 Reviewed Sample Installations: May become part of the completed work if undisturbed at the time of Substantial Performance of The work, provided they comply with requirements outlined in Contract Documents.

## **1.9 DELIVERY, STORAGE AND HANDLING**

- 1.9.1 Product Requirements, generally: in accordance with Section 01 61 00, Common Product Requirements.
- 1.9.2 Comply with requirements of GA-801.
- 1.9.3 Delivery: Deliver materials to site with manufacturer's original labels intact. Ensure packaging is not removed until materials are ready for installation.
- 1.9.4 Storage: Do not store materials outdoors. Store materials in a clean, dry, and well-ventilated area, off the ground, to prevent moisture, excessive humidity, and fungal growth. Immediately remove any boards that show signs of mould, mildew, or fungal growth.
- 1.9.5 Handling: Stack gypsum board flat on a level, dry surface without overhanging edges. Take precautions to prevent sagging and damage to the edges, ends, and surfaces of the boards. Protect bagged products from moisture and wetting to avoid degradation.
- 1.9.6 Do not install panels that are wet, those that are moisture damaged, and those that are mould damaged. Replace defective or damaged materials with new.

## **1.10 FIELD CONDITIONS**

- 1.10.1 Environmental Restrictions: Comply with ASTM C840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.
  - 1.10.1.1 Only install materials once areas are dry, and no further wet trades are scheduled.
  - 1.10.1.2 Maintain a temperature between 13°C (55°F) and 21°C (70°F) for at least 7 days before, during, and 4 days after gypsum board installation. Keep relative humidity below 55%.
  - 1.10.1.3 Provide proper ventilation for drying joint fillers and adhesives, without forcing drying.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURERS**

- 2.1.1 Provided requirements of Contract Documents are satisfied, the following manufacturers may supply Products for work this Section:
  - 2.1.1.1 Gypsum Panels:
    - .1 CertainTeed Gypsum Canada Inc. / Saint Gobain
    - .2 Georgia-Pacific Canada, L.P.
    - .3 National Gypsum
    - .4 Pabco Gypsum
    - .5 USG / CGC Inc.
  - 2.1.1.2 Metal Framing:
    - .1 Bailey Metal Products
    - .2 CGC Inc.

- .3 ClarkDietrich Building Systems
- .4 Approved equivalent manufacturer who is a member in good standing with CSSBI

## **2.2 PERFORMANCE / DESIGN CRITERIA**

- 2.2.1 Fire-Rated Assemblies: Provide materials and construction methods identical to those indicated on Drawings and Schedules and tested by an independent agency to CAN/ULC S101.
- 2.2.2 Shaft Wall Assemblies:
  - 2.2.2.1 Provide fire ratings as shown Drawings and Schedules, and in accordance with CAN/ULC S101.
  - 2.2.2.2 Design partitions around elevator shafts to fully accommodate structural members within required fire-rated construction, while maintaining shaft wall rating without interruption.
  - 2.2.2.3 Ensure no screws penetrate into shafts.
  - 2.2.2.4 Use components that are compatible and tested by independent testing agencies and accepted by authorities having jurisdiction.
- 2.2.3 STC-Rated Assemblies: Provide materials and construction methods identical to those indicated on Drawings and Schedules and tested by an independent agency to ASTM E90 and evaluated to ASTM E413.
  - 2.2.3.1 Note: Lightweight gypsum board is not permitted.
- 2.2.4 Partition Deflections:
  - 2.2.4.1 Design partitions to accommodate the following loads with deflection not exceeding L/240:
    - .1 Lateral Load for Partitions: 0.24 kPa (5 psf)
    - .2 Lateral Load for Firewalls: 0.51 kPa (10 psf)
    - .3 Lateral Load for Elevator Shaft Walls: 0.73 kPa (15 psf)
  - 2.2.4.2 For partitions with tile or brittle finishes: limit deflection to L/360.
  - 2.2.4.3 Where partition heights exceed stud manufacturer's recommended spans, and to resist deflection limits, provide one of the following:
    - .1 Heavier stud gage.
    - .2 Closer stud spacing.
    - .3 Deeper stud size (space permitting, as determined by Consultant).
    - .4 Above-ceiling bracing, anchored to structure above.
- 2.2.5 Guards: Where partitions are acting as guards, comply with Division B, Part 4, Article 4.1.5.17 of the Ontario Building Code. Provide Shop Drawings bearing the stamp of a licensed engineer registered in the province where the project is located, confirming this requirement.
- 2.2.6 Gypsum Ceilings: Design suspension system to support weight of mechanical and electrical items such as air grilles and lighting fixtures and similar components with deflection limited to L/360 and conforming to ASTM C754 requirements.

- 2.2.6.1 Provide adequate support to allow rotation and relocation of light fixtures.
- 2.2.6.2 Design sub-framing as necessary to accommodate, and to circumvent, conflicts and interferences where ducts or other equipment prevent regular spacing of hangers.
- 2.2.6.3 Do not suspend items from structural steel deck.
- 2.2.6.4 Do not support work of this Section from, nor make attachments to ducts, pipes, conduits or support framing of other trades.
- 2.2.6.5 Design suspension system to support weight of mechanical and electrical items such as air grilles, lighting fixtures, drapery track, drapes and with adequate support to allow rotation/ relocation of light fixtures.
- 2.2.7 Reinforcing: Provide in-wall reinforcing to support items such as washroom accessories, casework, millwork, and wall-mounted equipment. Do not use wood blocking.
- 2.2.8 VOC Content and Emissions:
  - 2.2.8.1 VOC Emissions: For applicable items in this Section, comply with CDPH Standard Method v1.2–2017 (CA Spec 01350) and ensure products are certified per UL 2818, SCS Global Gold, or equivalent.
  - 2.2.8.2 VOC Content Requirements: Wet-applied materials used in scope of this Section must conform to the following:
    - .1 Paints and Coatings: SCAQMD Rule 1113 or CARB SCM.
    - .2 Adhesives and Sealants: SCAQMD Rule 1168.
    - .3 Methylene chloride and perchloroethylene must not be intentionally added in paints, coatings, adhesives, or sealants.

### 2.3 GYPSUM BOARD, GENERALLY

- 2.3.1 Unless indicated otherwise on Drawings and Schedules, provide 15.9 mm (5/8 inch) thick (Type X), 1200 mm (4 feet) wide board in maximum continuous lengths up to 3600 mm (12 feet) with beveled and/or tapered edges with butted square ends to suit design requirements.

Type	Standard	Typical Location	Notes
Gypsum board	ASTM C1396	Standard interior walls.	Provide type X unless indicated otherwise.
Gypsum Board (Ceiling) (GB-1)	ASTM C1396	Standard interior ceilings.	Provide type X unless indicated otherwise.
Gypsum Coreboard / Gypsum Shaftliner Board	ASTM C1658	Shaft walls and where noted on Drawings.	Provide glass-mat gypsum board unless indicated otherwise.
Glass Mat Gypsum Panels (paperless / cellulose-free)	ASTM C1658	Interior walls in wet locations and within 1200 mm from each	Mold Resistance Rating: 10 with no mold growth after 4 weeks exposure in

		side of water sources or plumbing fixtures.	accordance with ASTM D3273.
Glass Mat Gypsum Panels (paperless / cellulose-free) (GB-2)	ASTM C1658	Interior ceilings in wet locations and within 1200 mm from each side of water sources or plumbing fixtures.	Mold Resistance Rating: 10 with no mold growth after 4 weeks exposure in accordance with ASTM D3273.
Glass Mat Water-Resistant Gypsum Backing Board (paperless / cellulose-free)	ASTM C1178	Substrate for tiles.	Mold Resistance Rating: 10 with no mold growth after 4 weeks exposure in accordance with ASTM D3273.

**2.3.2 Basis-of-Design:****2.3.2.1 Gypsum board (GB-1):**

- .1 "Sheetrock® - Regular Gypsum Panels" by CGC
- .2 "ToughRock® Gypsum Boards" by Georgia-Pacific Canada, L.P.
- .3 "Type X Drywall" by CertainTeed Canada

**2.3.2.2 Gypsum Coreboard / Gypsum Shaftliner Board:**

- .1 Dens Glass Ultra Shaftliner by Georgia-Pacific Canada, L.P.
- .2 "GlasRoc® Shaft Liner Type X" by CertainTeed Gypsum, Canada Inc
- .3 "Sheetrock Brand Glass Mat liner Panels" by CGC Inc

**2.3.2.3 Glass Mat Gypsum Panels (Cellulose-Free) (GB-2):**

- .1 "Dens Armor Plus High performance Interior Panel" by Georgia-Pacific Canada, L.P.
- .2 "SheetRock Brand Glass-Mat Panel – Mold Tough" by CGC
- .3 "GlasRoc® Interior Drywall" by CertainTeed Gypsum, Canada Inc.

**2.3.2.4 Tile Backer: Following types are acceptable:**

- .1 Glass Mat Water-Resistant Gypsum Backing Board (Cellulose Free):
  - .1 "DensShield Tile Backer" by Georgia-Pacific Canada, L.P.
  - .2 "GlasRoc® Tile Backer" by CertainTeed Gypsum, Canada Inc.

**2.4 GYPSUM BOARD FINISH LEVELS****2.4.1 Finish panels to levels indicated below and according to ASTM C840 and as follows:**

- 2.4.1.1 Level 1: Ceiling plenum areas for smoke-rated partitions, concealed areas, and where indicated.
- 2.4.1.2 Level 2: Where gypsum board is substrate for tile. Ceiling plenum areas for fire-rated partitions.



- 2.4.1.3 Level 3: Not used.
- 2.4.1.4 Level 4: applied to all locations except where another level of finish is specified.
- 2.4.1.5 Level 5:
  - .1 Lobbies and atriums,
  - .2 Long corridors and hallways,
  - .3 Where epoxy paints or other gloss paints are scheduled to be installed,
  - .4 Where gypsum-applied films, wallcoverings and other finishes less than 4 mm (5/32 inch) thick are scheduled to be installed,
  - .5 Where glass mat gypsum panels are scheduled to be installed.

## **2.5 METAL FRAMING**

- 2.5.1 Framing Members: Comply with ASTM C754.
  - 2.5.1.1 Steel Sheet Components: to ASTM C645.
  - 2.5.1.2 Protective Coating: Unless otherwise noted, provide hot-dip galvanized products to ASTM A653/A653M, Z180 (G60). Galvannealed products are not acceptable. In high-moisture environments (e.g., pools, showers), provide ASTM A653/A653M, G90 (Z275) coating.
- 2.5.2 Studs and Runners: cold-formed galvanized-steel C-studs and runners to ASTM C645.
  - 2.5.2.1 Minimum Thickness: 0.45 mm (25 ga - 0.018 inch) unless otherwise indicated.
  - 2.5.2.2 Special Conditions:
    - .1 Provide minimum 0.836 mm (20 ga - 0.032 inch) at following conditions: partitions supporting lead lining.
    - .2 Provide 1.34 mm (16 ga - 0.053 inch) boxed studs to frame all openings unless otherwise indicated.
    - .3 Where stud gauges need to be increased due to unrestrained heights, use specialty high-capacity (EQ20) studs as specified in this Section.
  - 2.5.2.3 Lead Lining; Refer to Section 13 49 00 – Radiation Shielding System.
  - 2.5.2.4 Runners: Match depth and base-metal thickness of studs unless otherwise noted. Stud depth is as shown on Drawings.
- 2.5.3 Specialty High Capacity (EQ20) Studs: to ASTM C645, with minimum strength of 227 MPa (33 ksi) and acoustic characteristics equivalent to 0.45 mm (25 ga - 0.018 inch) studs.
  - 2.5.3.1 Runners: Match depth and base-metal thickness of studs unless otherwise noted. Stud depth is as shown on Drawings.
  - 2.5.3.2 Basis of Design: “B18 (Hard Board) Stud” by Bailey Metal Products or approved equivalent.

- 2.5.4 Furring Channels: Minimum 1.34 mm (16 ga - 0.053 inch) steel channels (Green color), with minimum 13 mm (1/2 inch) flanges.
  - 2.5.4.1 Depth: As shown on Drawings.
- 2.5.5 Cold-Rolled Channel Bridging: cold-rolled steel, minimum 0.836 mm (20 ga - 0.032 inch) with 13 mm (1/2 inch) flanges.
  - 2.5.5.1 Depth: Manufacturer's standard, but no less than 38 mm (1-1/2 inches).
- 2.5.6 Radius Track Framing: Manufacturer's standard expandable ribbon technology studs for non-load-bearing curves, bends, variable radii, and arches.
  - 2.5.6.1 Minimum Thickness: 0.45 mm (25 ga - 0.018 inch) unless otherwise noted. Provide heavier thicknesses as required for unrestrained heights or abuse resistance.
  - 2.5.6.2 Basis of Design: "Interior Contour Track" by ClarkDietrich Building Systems or approved equivalent.
- 2.5.7 Deflection Tracks: steel sheet runners designed to prevent finish cracking due to structural deflection.
  - 2.5.7.1 Acceptable Products:
    - .1 "Multi-Slot Track with Bailey Top Deflection Clip (TDC)" by Bailey Metal Systems.
    - .2 "Blazeframe DSL or MaxTrak Slotted Deflection Track" by Dietrich Metal Framing
    - .3 "VertiClip SLD or VertiTrack VTD Series" by The Steel Network Inc.
    - .4 "Vertical Slip Track" by Telling Industries
- 2.5.8 Firestop Tracks: Refer to Section 07 84 10.
- 2.5.9 Metal Flat Strap and Backing Plate:
  - 2.5.9.1 Provide Steel sheet for blocking and bracing in locations, lengths and widths indicated on Drawings.
  - 2.5.9.2 Minimum Thickness: 1.087 mm (18 ga - 0.043 inch) unless otherwise noted. Provide heavier thicknesses as required for unrestrained heights or abuse resistance.

## **2.6 CEILING SUSPENSION SYSTEM**

- 2.6.1 Suspension System Options: Contractor may elect to use either of following suspension systems:
  - 2.6.1.1 Traditional framed system with tie wires, hangers, anchorages, channels, and attachments.
  - 2.6.1.2 Manufactured direct-hung grid suspension system as specified in this section
- 2.6.2 Traditional Framed Suspension System Components
  - 2.6.2.1 Tie Wire: ASTM A641/A641M, Class 1 zinc-coated, soft temper, with minimum diameter: 1.291 mm (0.051 inch – 16 AWG).

- 2.6.2.2 Wire Hangers: ASTM A641, Class 1 galvanized, soft temper, with minimum diameter of 3.26 mm (0.129 inch – 8 AWG).
- 2.6.2.3 Furring Anchorages: to ASTM C754. Provide 1.291 mm (0.051 inch – 16 AWG) diameter galvanized wire ties, or manufacturer's recommended clips, bolts, nails, or screws for furring attachment.
- 2.6.2.4 Hanger Attachments:
  - .1 Cast-in-Place Concrete Anchors: Fabricated from corrosion-resistant materials with holes or loops for attaching wire hangers and capable of sustaining, without failure, a load equal to 5 times that imposed by construction as determined by testing according to ASTM E488 by an independent testing agency.
  - .2 Attachment to structural steel components: Comply with ASTM C754 unless otherwise indicated
- 2.6.3 Direct-Hung System: direct-hung suspension system to ASTM C645, made from commercial-quality cold-rolled steel. System must include main beams and cross-furring members that interlock and are designed for gypsum board suspension.
  - 2.6.3.1 Acceptable Systems:
    - .1 "Drywall Grid Systems" by Armstrong World Industries, Inc.
    - .2 "Drywall Suspension System" by CGC Inc.
    - .3 "Drywall Suspension System" by CertainTeed Canada
    - .4 "Chicago Metallic Drywall Grid" by Rockfon.

## **2.7 TRIMS**

- 2.7.1 Material: Galvanized or aluminum-coated steel sheet or rolled zinc conforming to ASTM C1047.
  - 2.7.1.1 Shapes: Provide as follows and as required to suit conditions encountered during installation.
    - .1 Cornerbead: at outside corners, unless otherwise indicated.
    - .2 U-Bead and LC-Bead: at exposed panel edges.

## **2.8 ACOUSTIC BLANKET / BATT INSULATION**

- 2.8.1 Mineral Wool Insulation
  - 2.8.1.1 Material Tag: This item is noted as "INS-12" on Drawings and Schedules.
  - 2.8.1.2 Description: CAN/ULC-S702.1/S702.2, Type 1; ASTM C553 (Type VII) and non-combustible in accordance with requirements of CAN/ULC-S114.
  - 2.8.1.3 Acceptable Products:
    - .1 "Rockwool AFB EVO" by Rockwool A/S
    - .2 "Thermafiber SAFB FF" Mineral Wool Insulation

- 2.8.1.4 Locations: Provide at typical sound-attenuated partitions unless indicated otherwise on Drawings.

## **2.9 AUXILIARY SOUND CONTROL MATERIALS**

- 2.9.1 Acoustical Joint Sealant: nonsag, paintable, nonstaining latex sealant complying with ASTM C834 designed to reduce airborne sound transmission through perimeter joints and openings in building construction based on testing per ASTM E90. Refer to Section 07 92 00.
- 2.9.2 Electrical Box Pads / Putty Pads: Moldable non-curing one component, intumescent, fire-rated material for through-penetration fire stop systems and sound attenuation systems; self-adhering; 3 mm (1/8 inch) thick minimum.
- 2.9.2.1 Basis-of-Design: "QuietPutty 380" by Pabco Gypsum
- 2.9.3 Noise Proofing and Damping Compound (where noted on Drawings): Provide water-based, viscoelastic compound with minimum damping coefficient of 0.5 when tested in accordance with ASTM E90.
- 2.9.3.1 Basis-of-Design: "Green-Glue Noise Proofing Compound" by Green Glue Company;
- .1 Acceptable Equivalent: "QuietGlue Pro" by Pabco Gypsum
- 2.9.4 Resilient Furring Channels: designed to reduce sound transmission, complete with sound absorbing tape.
- 2.9.4.1 Minimum Base Metal Thickness: 18 mils (0.0179 inch – 0.455 mm – 25 ga – Not Painted)
- 2.9.4.2 Dimensions: 12 mm x 64 mm (½ inch x 2-1/2 inch) by 3660 mm (12 feet -0 inch) long or as indicated on Drawings.
- 2.9.4.3 Acceptable Products: "RC-Plus Resilient Channel" by Bailey Metal Products Limited, "RC Deluxe® Resilient Channel (RCSD)" by ClarkDietrich, or "Resilient Channel" by Nicholson Rollforming.
- 2.9.5 Gaskets (where noted on Drawings): Closed cell neoprene, 3 mm (1/8") thick x 64 mm (2-1/2") wide.

## **2.10 AUXILIARY MATERIALS**

- 2.10.1 Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
- 2.10.2 Joint Treatment: to ASTM C475/C475M and as follows:
- 2.10.2.1 Tape:
- .1 Interior Gypsum Board: Paper.
- .2 Glass-Mat Gypsum Board: 10-by-10 glass mesh.
- .3 Tile Backing Panels: As recommended by panel manufacturer.
- 2.10.2.2 Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

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- .1 Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
  - .2 Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
    - .1 Use setting-type compound for installing paper-faced metal trim accessories.
  - .3 Fill Coat: For second coat, use setting-type, sandable topping compound.
  - .4 Finish Coat: For third coat, use setting-type, sandable topping compound.
  - .5 Skim Coat: For final coat of Level 5 finish, use drying-type, all-purpose compound.
  - .6 Joint Compound for Tile Backing Panels:
    - .1 Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.
    - .2 Cement Board: As recommended by backer unit manufacturer.
- 2.10.2.3 Where joint treatment is applied in fire-resistance-rated assemblies, provide compound tested in accordance with CAN/ULC-S115.
- 2.10.3 Access Doors and Panels:
- 2.10.3.1 Coordinate requirements with Mechanical and Electrical specifications.
  - 2.10.3.2 Size: As required to suit applications encountered, and if not indicated on Drawings, generally as follows:
    - .1 Minimum 305 mm x 305 mm (12 inch x 12 inch) for single valves;
    - .2 406 mm x 406 mm (16 inch x 16 inch) for groups of valves;
    - .3 610 mm x 610 mm (24 inch x 24 inch) for body access.
  - 2.10.3.3 Typical Non-Fire-Rated Applications:
    - .1 Material: Glass fiber reinforced gypsum (GFRG).
    - .2 Door / Door Frame: Formed GFRG door panel with a shell thickness of 3.18 mm to 9.53 mm (0.125 in to 0.375 in).
    - .3 ACUDOR
    - .4 Hinge: Concealed hinge system.
    - .5 Finish: Factory-applied primer, ready for field-applied finishing.
    - .6 Basis-of-Design: "GFRG-R" by Acudor.
      - .1 Acceptable Equivalent:
        - .1 "Bauco-Plus II" by Bauco Access panel Solutions Inc.
        - .2 "RGB" by Nystrom
  - 2.10.3.4 Typical Fire-Rated Applications:
    - .1 Material: 20-gauge steel door filled with fire-rated insulation; 16-gauge steel mounting frame.

- .2 Door / Door Frame: Door with drywall taping bead flange for gypsum integration.
- .3 Hinge: Concealed hinge.
- .4 Latch: Self-latching bolt with interior latch release mechanism.
- .5 Finish: Baked white enamel finish.
- .6 Performance: Fire Rating: to match adjacent partition or ceiling assemblies; UL or ULC Classified to CAN/ULC S101 or CAN/ULC S104.
- .7 Basis-of-Design: "FW-5050-DW" by Acudor.
  - .1 Acceptable Equivalent: "IW" by Nystrom.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- 3.1.1 Verify actual site conditions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.
- 3.1.2 Verify framing and furring are securely attached and appropriately sized and spaced. Ensure blocking, headers, and supports are in place for plumbing fixtures and accessories (e.g., soap dishes, grab bars and similar items).
- 3.1.3 Do not install building materials that show signs of biological growth.
- 3.1.4 Apply gypsum board only after anchors, blocking, sound attenuation, and mechanical and electrical work has been reviewed.

### **3.2 PREPARATION**

- 3.2.1 Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.
- 3.2.2 Align ceiling suspension system installation with overhead structural systems. Ensure structural anchorage are installed to achieve full strength at required spacing for ceiling support.
  - 3.2.2.1 Supply concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.
- 3.2.3 Coordination with Sprayed Fire-Resistive Materials:
  - 3.2.3.1 Before sprayed fire-resistive materials are applied, attach offset anchor plates or ceiling runners (tracks) to surfaces indicated to receive sprayed fire-resistive materials. Where offset anchor plates are required, provide continuous plates fastened to building structure not more than 600 mm (24 inches) o.c.

- 3.2.3.2 After sprayed fire-resistive materials are applied, remove them only to extent necessary for installation of non-load-bearing steel framing. Do not reduce thickness of fire-resistive materials below that required for fire-resistance ratings indicated. Protect adjacent fire-resistive materials from damage.

### **3.3 INSTALLING FRAMED ASSEMBLIES**

- 3.3.1 Installation Standard: ASTM C754.
- 3.3.2 Install framing and accessories plumb, square, and true to line, with connections securely fastened.
- 3.3.3 Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- 3.3.4 Install bracing at terminations in assemblies.
- 3.3.5 Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.
- 3.3.6 Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
  - 3.3.6.1 Framing Spacing: Provide framing members at 400 mm (16 inches) o.c., unless otherwise indicated in Contract Documents.
- 3.3.7 Install studs so flanges within framing system point in same direction.
- 3.3.8 Install tracks at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts that penetrate partitions above ceiling.
- 3.3.9 Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
- 3.3.10 Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install track section for cripple studs at head and secure to jamb studs.
  - 3.3.10.1 Install two studs at each jamb unless otherwise indicated.
  - 3.3.10.2 Install cripple studs at head adjacent to each jamb stud, with a minimum 13-mm (1/2-in.) clearance from jamb stud to allow for installation of control joint in finished assembly.
  - 3.3.10.3 Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
  - 3.3.10.4 Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
- 3.3.11 Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure. Install fire-rated gypsum board in

accordance with ULC Fire Resistance Directory. Seal joints and penetrations to meet fire-rating. Refer to Section 07 84 10.

3.3.11.1 Firestop Track: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.

3.3.11.2 Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.

3.3.12 Direct Furring: Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 610 mm (24 in.) o.c.

### **3.4 INSTALLING CEILING SUSPENSION SYSTEMS**

3.4.1 Install suspension system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

3.4.1.1 Hangers: Maximum 1220 mm o.c.

.1 Provide additional ceiling suspension hangers for light fixtures within 150 mm of each corner; and maximum of 600 mm around perimeter.

3.4.1.2 Carrying Channels Main Runners: Maximum 1220 mm o.c.

3.4.1.3 Furring Channels Furring Members: Maximum 406 mm (16 in.) o.c.

3.4.2 Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.

3.4.3 Suspend hangers from building structure as follows:

3.4.3.1 Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.

3.4.3.2 Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

3.4.3.3 Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.

3.4.4 Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.

3.4.4.1 Do not attach hangers to steel roof deck.

3.4.4.2 Do not attach hangers to permanent metal forms. Supply cast-in-place hanger inserts that extend through forms.

3.4.4.3 Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.

3.4.4.4 Do not connect or suspend steel framing from ducts, pipes, or conduit.



- 3.4.5 Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.

### **3.5 INSTALLING GYPSUM BOARD**

- 3.5.1 Comply with ASTM C840 as follows:

- 3.5.1.1 Application of Single-Ply Gypsum Board to Wood Framing: ASTM C840, System I.
- 3.5.1.2 Application of Two-Ply Gypsum Board to Wood Framing: ASTM C840, System II
- 3.5.1.3 Application of Gypsum Board to Steel Framing and Furring: ASTM C840, System VIII
- 3.5.1.4 Arches and Bending Radii: ASTM C840, System IX
- 3.5.1.5 Gypsum Board for Wall Tile or Tile Base Applied with Adhesive: ASTM C840, System X
- 3.5.1.6 Glass Mat Gypsum Board: GA 253 and manufacturer's instructions.
- 3.5.1.7 Control Joints: to ASTM C840, System XIII.

- 3.5.2 Full-Height Partitions:

- 3.5.2.1 Install full-height partitions as noted on Drawings. At a minimum, include full-height partitions for the following locations:
  - .1 Mechanical, electrical, security, telecommunications rooms
  - .2 Stairs, elevator shafts, chases, washrooms
  - .3 Fire-rated walls, private offices, conference rooms, and break rooms.

- 3.5.3 Position panels with moderate contact; do not force into place. Stagger end joints of adjacent panels and cut out openings neatly and tightly.

- 3.5.4 Use maximum practical length of gypsum board panels to minimize joints. Treat edges, joints, and cutouts as recommended by manufacturer.

- 3.5.5 Fastening Methods: Use screws for fastening single or double layers. Adhesives and supplementary fasteners may be used where required.

- 3.5.6 Single-Layer Application:

- 3.5.6.1 On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
- 3.5.6.2 On partitions/walls, apply gypsum panels horizontally (perpendicular to framing) unless otherwise indicated on Drawings and Schedules or required by fire-resistance-rated assembly, and minimize end joints.
- 3.5.6.3 Fastening Methods: Apply gypsum panels to supports with steel drill screws.

- 3.5.7 Multilayer Application:

- 3.5.7.1 On ceilings, apply gypsum board indicated for base layers before applying base layers on walls and partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and

offset face-layer joints one framing member, 400 mm (16 inches) minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.

- 3.5.7.2 On partitions and walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated on or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.

- 3.5.7.3 Fastening Methods: Fasten base layers and face layers separately to supports with screws.

**3.5.8 Curved Surfaces:**

- 3.5.8.1 Install panels horizontally (perpendicular to supports) and unbroken, to extent possible, across curved surface plus 300-mm- (12-inch-) long straight sections at ends of curves and tangent to them.

- 3.5.8.2 Fasten base layer to studs with screws 400 mm (16 inches) o.c. Center gypsum board face layer over joints in base layer, and fasten to studs with screws spaced 300 mm (12 inches) o.c.

**3.5.9 Moisture-Resistant Gypsum Board:**

- 3.5.9.1 Provide moisture-resistant gypsum board in wet areas and washrooms.
- 3.5.9.2 For shower walls, use tile backer board. Refer to Drawings for specific locations.

**3.6 FIRE-RATED ASSEMBLIES**

- 3.6.1 Provide fire rated enclosures, separations and assemblies as indicated on Drawings. Ensure materials for fire rated construction conform to requirements of authorities having jurisdiction to obtain fire rating shown on Drawings. Work in cooperation with Section providing firestopping work.
- 3.6.2 Where dissimilar components are built into fire rated assemblies ensure continuity of fire separation by boxing in elements with gypsum board and framing to suit requirements of authorities having jurisdiction.
- 3.6.3 Provide fire resistive joint system between gypsum board wall assembly and steel columns in accordance with applicable Code requirements. One of the following methods are acceptable:

**3.7 SHAFT WALLS**

- 3.7.1 Construct shaft wall assemblies to Provide fire resistance ratings indicated, from both sides, and to maintain airtight seal. Apply continuous sealant around partitions to ensure airtight shaft enclosures.
- 3.7.2 Install shaft wall studs at centres to meet design requirements in accordance with manufacturer's instructions or fire rated test design. Provide framing to enclose sides, tops and bottoms of shafts terminating at floor or in ceiling space, to maintain fire rating of shaft assembly.

- 3.7.3 Install shaft wall liner in accordance with manufacturer's instructions at areas where specially designed studs require shaft wall liner panel application as required.
- 3.7.4 Provide firestopping and smoke seals at penetrations as specified under Section 07 84 10.
- 3.7.5 Where shaft wall height exceeds maximum available panel height, liner panel joints shall be positioned within upper and lower third points of wall, and shall be staggered to prevent continuous horizontal joint.
- 3.7.6 Frame around duct openings through shaft walls with 'J' runners.]

### **3.8 STC-RATED AND SMOKE RATED ASSEMBLIES**

- 3.8.1 Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C919 and with manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.
- 3.8.2 Provide acoustic insulation to completely fill height of stud cavities. Tightly butt ends and sides of blankets within cavities. Cut blankets to fit small spaces.
- 3.8.3 Carefully fit blankets behind electrical outlets, bracing, fixture attachments and mechanical and electrical services.
- 3.8.4 Install sound attenuation blankets before installing gypsum panels. Staple blankets to back of gypsum board as recommended by gypsum board manufacturer.

### **3.9 INSTALLING TRIM ACCESSORIES**

- 3.9.1 For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- 3.9.2 Control Joints: Install control joints according to ASTM C840 and in specific locations approved by Consultant for visual effect.
  - 3.9.2.1 Provide control joints at following locations:
    - .1 support construction changes.
    - .2 At 9 m (30') o.c. on partition, ceiling or furring runs.
  - 3.9.2.2 Provide control joints full height floor to ceiling or door header to ceiling in partitions and furring runs.
  - 3.9.2.3 Provide control joints from wall to wall in ceiling areas.
  - 3.9.2.4 Obtain Consultant's acceptance of exact locations of control joints.

### **3.10 TOLERANCES**

- 3.10.1 Framing Tolerances: Install each framing member so fastening surfaces vary not more than 3 mm (1/8 inch) in 3000 mm (10'-0 inch) in any direction.

### **3.11 FINISHING GYPSUM BOARD**

- 3.11.1 Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- 3.11.2 Prefill open joints and damaged surface areas.
- 3.11.3 Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.
- 3.11.4 Finish panels to levels indicated below and according to ASTM C840 as follows:

<b>Finishing Level</b>	<b>Final Appearance</b>
Level 0:	Unfinished
Level 1:	Tool marks and ridges are acceptable.
Level 2:	Tool marks and ridges are acceptable. Thin coating of compound covers tape; one coat compound over fastener heads.
Level 3:	No marks or ridges. Ready for priming, to be followed by textured finish.
Level 4:	No marks or ridges. Ready for priming.
Level 5:	No marks or ridges. Entire surface covered with skim coat of compound and ready for priming.

### **3.12 PROTECTION**

- 3.12.1 Protect gypsum board assemblies from damage, soiling and contaminating substances resulting from construction activities or caused by work of other trades.
- 3.12.2 Cooperate and coordinate with other Sections to obtain satisfactory gypsum board finish work. Do all cutting, patching and Make Good as required by installation of work of other Sections.
- 3.12.3 Clean off beads, casings, joint cement droppings and similar items and remove surplus materials and rubbish on completion and as directed.
- 3.12.4 Promptly replace gypsum board assemblies work damaged during construction that cannot be satisfactorily repaired.

**3.13 CLEANING AND WASTE MANAGEMENT**

3.13.1 Cleaning: Maintain clean construction area at the end of each day. When activities of this Section are complete, remove materials, tools, equipment and rubbish.

3.13.2 Waste Management and Disposal: sort waste for reuse, recycling, or disposal, as specified. Remove recycling bins and containers from site and dispose of contents at the appropriate waste disposal facilities.

**END OF SECTION**

## **PART 1      GENERAL**

### **1.1      GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.
- 1.1.2 Contractor is solely responsible for dividing the Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of the Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2      SUMMARY**

- 1.2.1 Provide labour, materials, Products, equipment and services to complete the acoustical ceilings work specified herein. This includes, but is not necessarily limited, to:
  - 1.2.1.1 Acoustical ceiling tiles
  - 1.2.1.2 Metal suspension systems
  - 1.2.1.3 Accessories
  - 1.2.1.4 Metal edge mouldings and trims
  - 1.2.1.5 Acoustical sealants
  - 1.2.1.6 Auxiliary materials required for a complete installation.
- 1.2.2 Related Requirements: Specifications throughout all Divisions of the Project shall be read as a whole, and may be directly applicable to this Section. Related requirements provided below are for convenience purposes only:
  - 1.2.2.1 Section 05 50 00 - Metal Fabrications.
  - 1.2.2.2 Section 06 10 00 - Rough Carpentry.
  - 1.2.2.3 Section 09 21 16 - Gypsum Board Assemblies.

### **1.3      REFERENCES**

- 1.3.1 Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply.

### **1.4      ADMINISTRATIVE REQUIREMENTS**

- 1.4.1 Pre-installation Meetings: Schedule and hold a pre-installation meeting at the Project site before beginning work on this Section to coordinate activities with related Subcontractors.
  - 1.4.1.1 Notification: Where Consultant attendance is required; minimum 72 hour notice is required.
  - 1.4.1.2 Reporting: Record significant discussions, agreements, and disagreements, including required corrective measures and actions.

- 1.4.1.3 Distribution: Distribute minutes of the meeting to each party present and to other parties requiring information not more than 72 hours after meeting.

## **1.5 SUBMITTALS**

- 1.5.1 Submittals, generally: in accordance with Section 01 33 00, Submittal Procedures.
- 1.5.2 Product Data: Submit manufacturer's product characteristics, catalogue cuts, installation instructions and other relevant information for each material and product used for acoustical ceilings work specified in this Section.
- 1.5.3 Shop Drawings: Submit Shop Drawings indicating material layouts, details of construction, connections, and relationship with adjacent construction. As a minimum indicate following:
  - 1.5.3.1 Include plans, elevations, sections and details as applicable.
  - 1.5.3.2 Indicate field-measured dimensions on Shop Drawings.
  - 1.5.3.3 Suspended ceiling components.
  - 1.5.3.4 Structural members to which suspension systems will be attached.
  - 1.5.3.5 Size and location of initial access modules for acoustical panels.
  - 1.5.3.6 Items penetrating finished ceiling including the following:
    - .1 Lighting fixtures.
    - .2 Air outlets and inlets.
    - .3 Speakers.
    - .4 Sprinklers.
    - .5 Access panels.
  - 1.5.3.7 Perimeter mouldings.
  - 1.5.3.8 Reflected ceiling plans must match measurement system (e.g. imperial or metric) indicated on Drawings.
- 1.5.4 Delegated Design Submittals:
  - 1.5.4.1 Engineering design completion of acoustical ceilings work is delegated to Contractor based on structural design criteria indicated in Contract Documents.
  - 1.5.4.2 Submit Shop Drawings for work of this Section that bear the stamp of a Professional Engineer registered in Province of Ontario.
  - 1.5.4.3 Submit copy of structural calculations upon request by Consultant.
- 1.5.5 Environmental and Material Transparency:
  - 1.5.5.1 Embodied Carbon / EPDs: When available, Submit EPDs conforming to ISO 14025 or equivalent standard; prioritize products with such documentation when choices are at Contractor's option.
  - 1.5.5.2 Material Ingredient Disclosure: When available, submit documentation identifying chemical inventories of materials to at least 0.1% (1000ppm) in accordance with HPD Open Standard, Cradle to Cradle

(Basic v2/Bronze v3), ILFI Declare, or equivalent standard; products with such documentation when choices are at Contractor's option.

- 1.5.6 Low-Emitting Materials: For applicable Products specified or used for activities of this Section (i.e., site-applied coatings, adhesives, and sealants), submit certifications from third-party organizations indicating compliance with following:
  - 1.5.6.1 VOC Emissions: California Department of Public Health (CDPH) Standard Method v1.2–2017, using applicable exposure scenario.
  - 1.5.6.2 VOC Content: SCAQMD Rule 1113 (for paints and coatings) and SCAQMD Rule 1168 (for adhesives and sealants).
- 1.5.7 Samples: Submit selection and verification samples for acoustical ceilings work requiring colour, texture, or design selection. Submit manufacturer's list of finishes or colour swatches for Consultant's selection.
  - 1.5.7.1 As a minimum submit samples of the following:
    - .1 Submit 150 mm (6") long samples of suspension system parts, including trim.
    - .2 Submit 150 mm x 150 mm (6" x 6") samples of acoustic panels.

## **1.6 CLOSEOUT SUBMITTALS**

- 1.6.1 Operating and Maintenance Data: Submit care and maintenance instructions for acoustical ceilings to be included in building operation and maintenance manual.
- 1.6.2 Warranty Documentation: Submit copy of extended warranties specified in this Section.

## **1.7 MAINTENANCE MATERIAL SUBMITTALS**

- 1.7.1 Extra Stock Materials: Deliver, for Owner's future maintenance use, additional materials equal to not less than two (2)% of each colour, pattern and type of tiling installed.
  - 1.7.1.1 Identify each package with pertinent information, including manufacturer's name, Product name, series and colour.
  - 1.7.1.2 Unless indicated otherwise, maintenance materials submitted must be from same production run as installed materials.
  - 1.7.1.3 Store materials in locations directed by Owner.

## **1.8 QUALITY ASSURANCE**

- 1.8.1 Manufacturer Qualifications: Provide Products for work of this Section by manufacturer with at least 10 years' experience manufacturing such materials.
- 1.8.2 Installer Qualifications: Engage an entity with sufficient experience installing, erecting, or assembling work similar in material, design, and extent to that shown on Drawings and Schedules, and whose work has resulted in construction with a track record of successful in-service performance.
- 1.8.3 Professional Engineer's Qualifications: Employ Professional Engineer licensed to practice in Province of Ontario who carries professional liability insurance and has at least five years' experience providing engineering services of similar kind, scope, and complexity.



**1.8.3.1 Professional Engineer's Responsibility:**

- .1 production and review of Shop Drawings,
- .2 design and certification of acoustical ceilings, including attachments for building construction, in accordance with applicable codes and regulations,
- .3 stamping and signing of each Shop Drawing and associated calculations

1.8.4 Single Source Responsibility: Obtain primary materials for this Section from a single source by a single manufacturer, and secondary materials from sources recommended by manufacturers of primary materials.

1.8.5 First Installation Review: Construct sample installations to verify selections made under submittals, demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

1.8.5.1 Location: In-situ (i.e. first installation), as directed on site by Consultant.

1.8.5.2 Purpose: To set benchmarks for installation and to judge subsequent work. Maintain such sample installations during construction in undisturbed condition.

1.8.5.3 Reviewed Sample Installations: May become part of the completed work if undisturbed at the time of Substantial Performance of The work, provided they comply with requirements outlined in Contract Documents.

**1.9 DELIVERY, STORAGE AND HANDLING**

1.9.1 Product Requirements, generally: in accordance with Section 01 61 00, Common Product Requirements.

1.9.2 Deliver, store and handle acoustical ceilings materials in accordance with manufacturer's written instructions. Deliver materials to site in original factory packaging, labelled with manufacturer's name and address. Store materials in off-ground, in clean, dry, well-ventilated area. Replace defective or damaged materials with new.

1.9.3 Comply with ceiling panel manufacturer's recommendations regarding temperature and humidity conditions before, during and after ceiling installation.

1.9.4 Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

**1.10 FIELD CONDITIONS**

1.10.1 Environmental Restrictions: Do not deliver or install acoustical ceilings until building is enclosed, wet work is complete, and HVAC system is operational and will maintain temperature and relative humidity levels equal to occupancy levels for remainder of construction period.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURERS**

2.1.1 Provided requirements of Contract Documents are satisfied, the following manufacturers may supply Products for work this Section:

- 2.1.1.1 Armstrong World Industries Canada Ltd.;
- 2.1.1.2 CertainTeed Ceilings;
- 2.1.1.3 CGC Inc.;
- 2.1.1.4 Rockfon;

### **2.2 PERFORMANCE / DESIGN CRITERIA**

2.2.1 Acoustical Panel Standard: Provide manufacturer's standard panels according to ASTM E1264 and designated by type, form, pattern, acoustical rating, and light reflectance unless otherwise indicated.

2.2.2 Suspension System Standard: Unless otherwise indicated, manufacture ceiling suspension Products to minimum requirements of ASTM C635/C635M, for Heavy Duty, modified as required to suit grid design shown.

2.2.3 Seismic Installation Requirements: to ASTM E580, Seismic Design Category C

2.2.4 Design suspension system to safely support entire ceiling system without distortion, including superimposed loads of the following items:

- 2.2.4.1 Lighting fixtures,
- 2.2.4.2 Air supply diffusers, boots, fire alarm grilles and exhaust and return air grilles;
- 2.2.4.3 Drapery tracks and drapes.

2.2.5 Coordinate installation and cooperate with Mechanical and Electrical Subcontractors, to accommodate mechanical and electrical items, or any other work required to be incorporated in or coordinated with the ceiling system.

2.2.6 Surface-Burning Characteristics: Acoustical ceiling tile to have undergone testing to CAN/ULC S102/S102 based on testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

- 2.2.6.1 Flame-Spread Index: 25 or less.
- 2.2.6.2 Smoke-Developed Index: 50 or less.

2.2.7 Prepare panels for sprinkler head penetrations and suspension members of curtain tracks.

2.2.8 VOC Content and Emissions:

- 2.2.8.1 VOC Emissions: For applicable items in this Section, comply with CDPH Standard Method v1.2–2017 (CA Spec 01350) and ensure products are certified per UL 2818, SCS Global Gold, or equivalent.
- 2.2.8.2 VOC Content Requirements: Wet-applied materials used in scope of this Section must conform to the following:
  - .1 Paints and Coatings: SCAQMD Rule 1113 or CARB SCM.
  - .2 Adhesives and Sealants: SCAQMD Rule 1168.

- .3 Methylene chloride and perchloroethylene must not be intentionally added in paints, coatings, adhesives, or sealants.

## **2.3 ACOUSTICAL CEILING TILES (ACT-#)**

- 2.3.1 Refer to Section 09 06 00 - Schedule of Finishes for Product selections.

## **2.4 METAL SUSPENSION-SYSTEM**

- 2.4.1 Description: manufacturer's standard, direct-hung, metal suspension system and accessories according to ASTM C635/C635M and designated by type, structural classification, and finish indicated on Section 09 06 00 - Schedule of Finishes.

## **2.5 ACCESSORIES**

- 2.5.1 Attachment Devices: Fasteners must be sized to handle five times the calculated ceiling weight, per ASTM C635/C635M, Table 1, unless different loads are specified.
- 2.5.2 Anchors in Concrete: Use concrete anchors of specified type and material with holes or loops for attaching hangers.
  - 2.5.2.1 Strength: anchors to be of sufficient strength to sustain ceiling system under maximum load conditions (limit states design), as confirmed by testing according to ASTM E488/E488M or ASTM E1512, performed by a qualified testing agency.
  - 2.5.2.2 Corrosion Protection (Standard): Steel anchors with zinc coating to ASTM B633, Class SC 1 for typical indoor environments.
- 2.5.3 Wire Hangers, Braces, and Ties:
  - 2.5.3.1 Steel Wire (standard): zinc-coated carbon steel wire complying with ASTM A641/A641M, Class 1 coating, soft temper.
  - 2.5.3.2 Size: minimum 2.69 mm (0.106 inch) wire diameter. Provide wire diameter of sufficient strength such that stress on wire is inferior to wire its yield strength when supporting three times hanger design load per ASTM C635/C635M, Table 1.
- 2.5.4 Hanger Rods: galvanized steel hanger rods.
- 2.5.5 Flat Hangers: Flat galvanized steel hangers.
- 2.5.6 Angle Hangers: steel angles with minimum 22 mm (7/8 inch) wide legs, fabricated from 1 mm (0.04 inch) thick galvanized steel complying with ASTM A653/A653M, Z275 (G90) coating. Ensure connections are bolted with 8 mm (5/16 inch) diameter bolts.
- 2.5.7 Seismic Accessories:
  - 2.5.7.1 Seismic Clips: manufacturer's standard seismic clips to secure ceiling panels during seismic events.
  - 2.5.7.2 Seismic Stabilizer Bars: manufacturer's standard perimeter stabilizer bars designed to handle seismic forces.
  - 2.5.7.3 Seismic Struts: manufacturer's standard compression struts designed to resist seismic forces.

## **2.6 METAL EDGE MOLDINGS AND TRIM**

- 2.6.1 Materials: Provide edge mouldings and trim manufactured of steel or aluminum as shown on Drawings or specified in this Section. Match material, finish, and colour of exposed suspension runners. Ensure compliance with seismic design requirements.
- 2.6.2 Compatibility: Use mouldings compatible with panel edge details and suspension systems. Match width and configuration of exposed runners unless noted.
- 2.6.3 Reveal Edge Details: For reveal panels, provide stepped mouldings matching panel-reveal depth/width.
- 2.6.4 Circular Penetrations: Provide mouldings sized to fit penetrations exactly.
- 2.6.5 Custom Trim: Provide perimeter trim, including tee-bar clips and galvanized steel or aluminum splice plates.
- 2.6.6 Basis-of-Design Products: "Compasso Trim" by USG/CGC Inc.
- 2.6.7 Acceptable Equivalent: "AXIOM" by Armstrong World Industries, "Infinity Trim" by Rockfon, "Terminus Perimeter Trim" by CertainTeed Canada

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- 3.1.1 Verify actual site conditions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.
- 3.1.2 Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.
- 3.1.3 Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 PREPARATION**

- 3.2.1 Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.
- 3.2.2 Layout openings for penetrations centered on the penetrating items.

### **3.3 INSTALLATION**

- 3.3.1 Installation, generally: Install work of this Section in strict accordance with manufacturer's written installation instructions and reviewed Shop Drawings. Supplement manufacturer's installation instructions with additional installation requirements specified in this Section to produce specified work results.
- 3.3.2 General Installation Standard: Comply with ASTM C636/C636M
- 3.3.3 Seismic Installation Standard: Comply with ASTM E580
- 3.3.4 Suspend ceiling hangers from building's structural members and as follows:

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- 3.3.4.1 Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
  - 3.3.4.2 Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
  - 3.3.4.3 Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
  - 3.3.4.4 Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
  - 3.3.4.5 Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both the structure to which hangers are attached and the type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
  - 3.3.4.6 Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
  - 3.3.4.7 When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
  - 3.3.4.8 Do not attach hangers to steel deck tabs.
  - 3.3.4.9 Do not attach hangers to steel roof deck. Attach hangers to structural members.
  - 3.3.4.10 Space hangers not more than 48 inches (1200 mm) o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches (200 mm) from ends of each member.
  - 3.3.4.11 Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
  - 3.3.5 Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or post-installed anchors.
  - 3.3.6 Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

- 3.3.7 Install edge mouldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
  - 3.3.7.1 Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of mouldings before they are installed.
  - 3.3.7.2 Screw attach mouldings to substrate at intervals not more than 400 mm (16 inches) o.c. and not more than 75 mm (3 inches) from ends, leveling with ceiling suspension system to a tolerance of 3.2 mm in 3.6 m (1/8 inch in 12 feet). Mitre corners accurately and connect securely.
  - 3.3.7.3 Do not use exposed fasteners, including pop rivets, on mouldings and trim.
- 3.3.8 Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge mouldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
  - 3.3.8.1 Arrange directionally patterned acoustical panels as indicated on reflected ceiling plans.
  - 3.3.8.2 For square-edged panels, install panels with edges fully hidden from view by flanges of suspension-system runners and mouldings.
  - 3.3.8.3 For reveal-edged panels on suspension-system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
  - 3.3.8.4 For reveal-edged panels on suspension-system members with box-shaped flanges, install panels with reveal surfaces in firm contact with suspension-system surfaces and panel faces flush with bottom face of runners.
  - 3.3.8.5 Paint cut edges of panel remaining exposed after installation; match colour of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.
  - 3.3.8.6 Protect lighting fixtures and air ducts to comply with requirements indicated for fire-resistance-rated assemblies.

### **3.4 ERECTION TOLERANCES**

- 3.4.1 Suspended Ceilings: Install main and cross runners level to a tolerance of 3 mm in 3.6 m (1/8 inch in 12 feet), non-cumulative.
- 3.4.2 Mouldings and Trim: Install mouldings and trim to substrate and level with ceiling suspension system to a tolerance of 3 mm in 3.6 m (1/8 inch in 12 feet), non-cumulative.

### **3.5 PROTECTION**

- 3.5.1 Protect acoustical ceilings from damage, soiling and contaminating substances resulting from construction activities or caused by work of other trades.
- 3.5.2 Where soiling or spills have occurred, remove spills and soiling from adjacent surfaces using cleaning procedures recommended in writing by affected material's manufacturer. Do not use materials or process that can damage finishes, surfaces, or construction.

- 3.5.3 Promptly replace acoustical ceilings work damaged during construction that cannot be satisfactorily repaired.

### **3.6 CLEANING AND WASTE MANAGEMENT**

- 3.6.1 Cleaning: Maintain clean construction area at the end of each day. When activities of this Section are complete, remove materials, tools, equipment and rubbish.
  - 3.6.1.1 Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage.
  - 3.6.1.2 Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.
- 3.6.2 Waste Management and Disposal: sort waste for reuse, recycling, or disposal, as specified. Remove recycling bins and containers from site and dispose of contents at the appropriate waste disposal facilities.

**END OF SECTION**

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## **PART 1      GENERAL**

### **1.1      GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.
- 1.1.2 Contractor is solely responsible for dividing the Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of the Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2      SUMMARY**

- 1.2.1 Provide labour, materials, Products, equipment and services to complete the resilient base work specified herein. This includes, but is not necessarily limited, to:
  - 1.2.1.1 Resilient rubber base.
  - 1.2.1.2 Moulding accessories.
  - 1.2.1.3 Auxiliary materials required for a complete installation.
- 1.2.2 Related Requirements: Specifications throughout all Divisions of the Project shall be read as a whole, and may be directly applicable to this Section. Related requirements provided below are for convenience purposes only:
  - 1.2.2.1 Section 07 92 00 - Joint Sealants
  - 1.2.2.2 Section 09 65 16 - Resilient Sheet Flooring

### **1.3      REFERENCES**

- 1.3.1 Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply.

### **1.4      ADMINISTRATIVE REQUIREMENTS**

- 1.4.1 Pre-installation Meetings: Schedule and hold a pre-installation meeting at the Project site before beginning work on this Section to coordinate activities with related Subcontractors.
  - 1.4.1.1 Notification: Where Consultant attendance is required; minimum 72 hour notice is required.
  - 1.4.1.2 Reporting: Record significant discussions, agreements, and disagreements, including required corrective measures and actions.
  - 1.4.1.3 Distribution: Distribute minutes of the meeting to each party present and to other parties requiring information not more than 72 hours after meeting.



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## **1.5 SUBMITTALS**

- 1.5.1 Submittals, generally: in accordance with Section 01 33 00, Submittal Procedures.
- 1.5.2 Product Data: Submit manufacturer's product characteristics, catalogue cuts, installation instructions and other relevant information for each material and product used for resilient base work specified in this Section.
- 1.5.3 Environmental and Material Transparency:
  - 1.5.3.1 Embodied Carbon / EPDs: When available, Submit EPDs conforming to ISO 14025 or equivalent standard; prioritize products with such documentation when choices are at Contractor's option.
  - 1.5.3.2 Material Ingredient Disclosure: When available, submit documentation identifying chemical inventories of materials to at least 0.1% (1000ppm) in accordance with HPD Open Standard, Cradle to Cradle (Basic v2/Bronze v3), ILFI Declare, or equivalent standard; products with such documentation when choices are at Contractor's option.
- 1.5.4 Samples: Submit selection and verification samples for resilient base work requiring colour, texture, or design selection. Submit manufacturer's list of finishes or colour swatches for Consultant's selection.
  - 1.5.4.1 As a minimum submit samples of the following: not less than 300 mm (12 inches) long for each colour and texture specified.

## **1.6 MAINTENANCE MATERIAL SUBMITTALS**

- 1.6.1 Extra Stock Materials: Deliver, for Owner's future maintenance use, additional materials equal to not less than 3 linear m (10 linear feet) for every 150 linear m (500 linear feet) or fraction thereof, of each colour, pattern and type of resilient base installed.
  - 1.6.1.1 Identify each package with pertinent information, including manufacturer's name, Product name, series and colour.
  - 1.6.1.2 Unless indicated otherwise, maintenance materials submitted must be from same production run as installed materials.
  - 1.6.1.3 Store materials in locations directed by Owner.

## **1.7 QUALITY ASSURANCE**

- 1.7.1 Manufacturer Qualifications: Provide Products for work of this Section by manufacturer with at least 10 years' experience manufacturing such materials.
- 1.7.2 Installer Qualifications: Engage an entity with sufficient experience installing, erecting, or assembling work similar in material, design, and extent to that shown on Drawings and Schedules, and whose work has resulted in construction with a track record of successful in-service performance.
- 1.7.3 Single Source Responsibility: Obtain primary materials for this Section from a single source by a single manufacturer, and secondary materials from sources recommended by manufacturers of primary materials.

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1.7.4 First Installation Review: Construct sample installations to verify selections made under submittals, demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

1.7.4.1 Location: In-situ (i.e. first installation), as directed on site by Consultant.

1.7.4.2 Purpose: To set benchmarks for installation and to judge subsequent work. Maintain such sample installations during construction in undisturbed condition.

1.7.4.3 Reviewed Sample Installations: May become part of the completed work if undisturbed at the time of Substantial Performance of The work, provided they comply with requirements outlined in Contract Documents.

## **1.8 DELIVERY, STORAGE AND HANDLING**

1.8.1 Product Requirements, generally: in accordance with Section 01 61 00, Common Product Requirements.

1.8.2 Deliver, store and handle resilient base materials in accordance with manufacturer's written instructions. Deliver materials to site in original factory packaging, labelled with manufacturer's name and address. Store materials in off-ground, in clean, dry, well-ventilated area. Replace defective or damaged materials with new.

## **1.9 FIELD CONDITIONS**

1.9.1 Environmental Restrictions: Do not deliver or install resilient base until building is enclosed, wet work is complete, and HVAC system is operational and will maintain temperature and relative humidity levels equal to occupancy levels for remainder of construction period.

1.9.2 Install resilient products after other finishing operations, including painting, have been completed.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURERS**

2.1.1 Provided requirements of Contract Documents are satisfied, the following manufacturers may supply Products for work this Section:

2.1.1.1 Armstrong Flooring

2.1.1.2 Johnsonite / Tarkett

2.1.1.3 Roppe Corporation

2.1.1.4 Flexco

2.1.1.5 American Biltrite (Canada) Ltd.,

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## 2.2 PERFORMANCE / DESIGN CRITERIA

2.2.1 Provide Products free from blisters, cracks, chipped edges and corners, embedded foreign matter or other defects as required to complete flooring installation and to meet following minimum requirements:

2.2.1.1 Fire-Test-Response Characteristics:

- .1 Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm per ASTM E648.

## 2.3 RUBBER BASE

2.3.1 **Material Tag: This item is noted as "RB-#" on Drawings and Schedules.**

2.3.2 Description: ASTM F1861, PVC free, Type TS (rubber, vulcanized thermoset) or TP (thermoplastic rubber), Group 1 (solid, homogeneous); smooth surface.

2.3.3 Style: Refer to Section 09 06 00 - Schedule of Finishes.

2.3.4 Thickness: Minimum 3.2 mm (0.125 inch) thick

2.3.5 Height: Refer to Section 09 06 00 - Schedule of Finishes

2.3.6 Colours: Refer to Section 09 06 00 - Schedule of Finishes

2.3.7 Basis-of-Design: Refer to Section 09 06 00 - Schedule of Finishes

## 2.4 FABRICATION

2.4.1 Lengths: Coils in manufacturer's standard length.

2.4.2 Corners: Job-formed using adhesive, cove former fillet radius reinforcing strips, welding rod and accessories as recommended by resilient base manufacturer.

2.4.3 Colours: selected by Consultant from manufacturer's full range including designer colours.

## 2.5 INSTALLATION MATERIALS

2.5.1 Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.

2.5.2 Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.

## PART 3 EXECUTION

### 3.1 EXAMINATION

3.1.1 Verify actual site conditions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.

3.1.2 Proceed with installation only after unsatisfactory conditions have been corrected.

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3.1.3 Installation of resilient products indicates acceptance of surfaces and conditions.

### **3.2 PREPARATION**

3.2.1 Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

3.2.2 Ensure substrates are permanently dry, clean, smooth, and structurally sound. Surfaces must be free of dust, loose particles, solvents, paint, grease, oil, wax, alkali, sealing/curing compounds, old adhesive, and any other foreign material, which could affect the installation and adhesive bond to substrate.

3.2.3 Do not install resilient products until they are the same temperature as the space where they are to be installed.

3.2.4 At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.

3.2.5 Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

### **3.3 RESILIENT BASE INSTALLATION**

3.3.1 Installation, generally: Install work of this Section in strict accordance with manufacturer's written installation instructions and reviewed Shop Drawings. Supplement manufacturer's installation instructions with additional installation requirements specified in this Section to produce specified work results.

3.3.2 Comply with manufacturer's written instructions for installing resilient base.

3.3.3 Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

3.3.4 Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.

3.3.5 Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates. Use manufacturer's recommended adhesives and trowels for substrates encountered.

3.3.6 Do not stretch resilient base during installation.

3.3.7 On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

3.3.8 Preformed Corners: Install preformed corners before installing straight pieces.

3.3.9 Job-Formed Corners:

3.3.9.1 Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 76 mm (3 inches) in length.

.1 Form without producing discoloration (whitening) at bends.

3.3.9.2 Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 76 mm (3 inches) in length.

.1 Miter or cope corners to minimize open joints.

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### **3.4 PROTECTION**

- 3.4.1 Protect resilient base from damage, soiling and contaminating substances resulting from construction activities or caused by work of other trades.
- 3.4.2 Where soiling or spills have occurred, remove spills and soiling from adjacent surfaces using cleaning procedures recommended in writing by affected material's manufacturer. Do not use materials or process that can damage finishes, surfaces, or construction.
- 3.4.3 Promptly replace resilient base work damaged during construction that cannot be satisfactorily repaired.

### **3.5 CLEANING AND WASTE MANAGEMENT**

- 3.5.1 Cleaning: Maintain clean construction area at the end of each day. When activities of this Section are complete, remove materials, tools, equipment and rubbish.
- 3.5.2 Perform the following operations immediately after completing resilient-product installation:
  - 3.5.2.1 Remove adhesive and other blemishes from exposed surfaces.
  - 3.5.2.2 Sweep and vacuum horizontal surfaces thoroughly.
  - 3.5.2.3 Damp-mop horizontal surfaces to remove marks and soil.
- 3.5.3 Waste Management and Disposal: sort waste for reuse, recycling, or disposal, as specified. Remove recycling bins and containers from site and dispose of contents at the appropriate waste disposal facilities.

**END OF SECTION**

## **PART 1 GENERAL**

### **1.1 GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.
- 1.1.2 Contractor is solely responsible for dividing the Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of the Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2 SUMMARY**

- 1.2.1 Provide labour, materials, Products, equipment and services to complete the resilient sheet flooring work specified herein. This includes, but is not necessarily limited, to:
  - 1.2.1.1 Rubber sheet flooring.
  - 1.2.1.2 Auxiliary materials required for a complete installation.
- 1.2.2 Related Requirements: Specifications throughout all Divisions of the Project shall be read as a whole, and may be directly applicable to this Section. Related requirements provided below are for convenience purposes only:
  - 1.2.2.1 Section 03 54 16 - Hydraulic Cement Underlayment
  - 1.2.2.2 Section 07 92 00 - Joint Sealants
  - 1.2.2.3 Section 09 65 13 - Resilient Base

### **1.3 REFERENCES**

- 1.3.1 Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply.

### **1.4 ADMINISTRATIVE REQUIREMENTS**

- 1.4.1 Pre-installation Meetings: Schedule and hold a pre-installation meeting at the Project site before beginning work on this Section to coordinate activities with related Subcontractors.
  - 1.4.1.1 Notification: Where Consultant attendance is required; minimum 72 hour notice is required.
  - 1.4.1.2 Reporting: Record significant discussions, agreements, and disagreements, including required corrective measures and actions.
  - 1.4.1.3 Distribution: Distribute minutes of the meeting to each party present and to other parties requiring information not more than 72 hours after meeting.

**1.5 SUBMITTALS**

- 1.5.1 Submittals, generally: in accordance with Section 01 33 00, Submittal Procedures.
- 1.5.2 Product Data: Submit manufacturer's product characteristics, catalogue cuts, installation instructions and other relevant information for each material and product used for resilient sheet flooring work specified in this Section.
- 1.5.3 Shop Drawings: Submit Shop Drawings indicating material layouts, details of construction, connections, and relationship with adjacent construction. As a minimum indicate following:
  - 1.5.3.1 Include plans, elevations, sections and details as applicable.
  - 1.5.3.2 Indicate field-measured dimensions on Shop Drawings.
- 1.5.4 Environmental and Material Transparency:
  - 1.5.4.1 Embodied Carbon / EPDs: When available, Submit EPDs conforming to ISO 14025 or equivalent standard; prioritize products with such documentation when choices are at Contractor's option.
  - 1.5.4.2 Material Ingredient Disclosure: When available, submit documentation identifying chemical inventories of materials to at least 0.1% (1000ppm) in accordance with HPD Open Standard, Cradle to Cradle (Basic v2/Bronze v3), ILFI Declare, or equivalent standard; products with such documentation when choices are at Contractor's option.
- 1.5.5 Samples: Submit selection and verification samples for resilient sheet flooring work requiring colour, texture, or design selection. Submit manufacturer's list of finishes or colour swatches for Consultant's selection.
  - 1.5.5.1 As a minimum submit samples of the following:
    - .1 Submit for each product and for each colour, texture, and pattern specified, in manufacturer's standard size, but minimum 150 mm x 230 mm (6 inches x 9 inches) sections. Sample to include center seam to illustrate quality of joint treatment.
    - .2 Welded-Seam Samples: for seamless-installation technique indicated and for each resilient sheet flooring product, colour, and pattern required; with seam running lengthwise and in centre of 150-by-230-mm (6-by-9-in.). Sample to be applied to a rigid backing and prepared by Installer for this Project.

**1.6 CLOSEOUT SUBMITTALS**

- 1.6.1 Operating and Maintenance Data: Submit care and maintenance instructions for resilient sheet flooring to be included in building operation and maintenance manual.
- 1.6.2 Warranty Documentation: Submit copy of extended warranties specified in this Section.

## **1.7 MAINTENANCE MATERIAL SUBMITTALS**

- 1.7.1 Extra Stock Materials: Deliver, for Owner's future maintenance use, additional materials equal to not less than two (2)% of each colour, pattern and type of tiling installed.
  - 1.7.1.1 Identify each package with pertinent information, including manufacturer's name, Product name, series and colour.
  - 1.7.1.2 Unless indicated otherwise, maintenance materials submitted must be from same production run as installed materials.
  - 1.7.1.3 Store materials in locations directed by Owner.

## **1.8 QUALITY ASSURANCE**

- 1.8.1 Manufacturer Qualifications: Provide Products for work of this Section by manufacturer with at least 10 years' experience manufacturing such materials.
- 1.8.2 Installer Qualifications: Engage an entity with sufficient experience installing, erecting, or assembling work similar in material, design, and extent to that shown on Drawings and Schedules, and whose work has resulted in construction with a track record of successful in-service performance.
- 1.8.3 Single Source Responsibility: Obtain primary materials for this Section from a single source by a single manufacturer, and secondary materials from sources recommended by manufacturers of primary materials.
- 1.8.4 First Installation Review: Construct sample installations to verify selections made under submittals, demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
  - 1.8.4.1 Location: In-situ (i.e. first installation), as directed on site by Consultant.
  - 1.8.4.2 Purpose: To set benchmarks for installation and to judge subsequent work. Maintain such sample installations during construction in undisturbed condition.
  - 1.8.4.3 Reviewed Sample Installations: May become part of the completed work if undisturbed at the time of Substantial Performance of The work, provided they comply with requirements outlined in Contract Documents.

## **1.9 DELIVERY, STORAGE AND HANDLING**

- 1.9.1 Product Requirements, generally: in accordance with Section 01 61 00, Common Product Requirements.
- 1.9.2 Deliver, store and handle resilient sheet flooring materials in accordance with manufacturer's written instructions. Deliver materials to site in original factory packaging, labelled with manufacturer's name and address. Store materials in off-ground, in clean, dry, well-ventilated area. Replace defective or damaged materials with new.
- 1.9.3 Store resilient sheet flooring and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but minimum 10 deg C (50 deg F) or more than 32 deg C (90 deg F). Store rolls upright.



**1.10 FIELD CONDITIONS**

- 1.10.1 Environmental Restrictions: Do not deliver or install resilient sheet flooring until building is enclosed, wet work is complete, and HVAC system is operational and will maintain temperature and relative humidity levels equal to occupancy levels for remainder of construction period.
- 1.10.2 Maintain ambient temperatures within range recommended by manufacturer, but minimum 21 deg C (70 deg F) or more than 29 deg C (85 deg F), in spaces to receive resilient sheet flooring during the following periods:
  - 1.10.2.1 48 hours before installation.
  - 1.10.2.2 During installation.
  - 1.10.2.3 48 hours after installation.
- 1.10.3 After installation and until Substantial Performance of the Work, maintain ambient temperatures within range recommended by manufacturer, but minimum 13 deg C (55 deg F) or more than 35 deg C (95 deg F).
- 1.10.4 Close spaces to traffic during resilient sheet flooring installation.
- 1.10.5 Close spaces to traffic for 48 hours after resilient sheet flooring installation.
- 1.10.6 Install resilient sheet flooring after other finishing operations, including painting, have been completed.

**1.11 WARRANTY**

- 1.11.1 Extended warranty: Submit for Owner's review and acceptance, manufacturer's extended warranty in which manufacturer commits to repair or replace components of resilient sheet flooring that fail within specified warranty period. Manufacturer's extended warranty is in addition to, and does not supersede, any other rights that Owner may have under Contract Documents.
  - 1.11.1.1 Material Warranty: 10 years from date of Substantial Performance of the Work.
  - 1.11.1.2 Workmanship Warranty: 2 years from date of Substantial Performance of the Work.
  - 1.11.1.3 Failures include, but not limited to, premature wear, tearing, cracking, separation, deterioration or loosening from substrate, seam failure, ripples, bubbling or puckering. Upon notification of such installation deficiencies, within warranty period, make necessary repairs or replacement at no cost to Owner.

**PART 2 PRODUCTS****2.1 PERFORMANCE / DESIGN CRITERIA**

- 2.1.1 Fire Performance: Critical Radiant Flux Classification: Class I, minimum 0.45 W/sq. cm per ASTM E648 based on testing by a qualified agency.
- 2.1.2 Slip Resistance: Provide materials having minimum coefficient of friction of 0.6 based on testing in accordance with ASTM D2047.

- 2.1.3 Provide resilient sheet flooring complying with CDPH Standard Method for VOC Emissions (California Specification 01350) for indoor air quality requirements in accordance with UL 2818 (Greenguard) Gold, SCS Global Services Indoor Advantage Gold or other third-party certification agency.
- 2.1.4 Use sheet flooring from consecutive manufacturing process to maintain consistent colour match between adjacent sheets. Replace installed products in areas showing undue colour variation, in the opinion of the Owner or Consultant.

## **2.2 EXISTING RUBBER FLOORING**

- 2.2.1 Material Tag: This item is noted as "MTE-#" on Drawings and Schedules.
- 2.2.2 Basis-of-Design: Refer to Section 09 06 00 - Schedule of Finishes.

## **2.3 RUBBER SHEET FLOORING**

- 2.3.1 Material Tag: This item is noted as "RSF-#" on Drawings and Schedules.
- 2.3.2 Product Standard: ASTM F1859 (without backing) or ASTM F1860 (with backing), Type I or Type II, Grade 1, with minimum 1 mm homogenous performance layer thickness.
- 2.3.3 Thickness: Refer to Section 09 06 00 - Schedule of Finishes.
- 2.3.4 Sheet Width: Minimum 1.8 m (6 ft.)
- 2.3.5 Installation Method: Heat welded unless indicated otherwise.
- 2.3.6 Colors and Patterns: Refer to Section 09 06 00 - Schedule of Finishes.
- 2.3.7 Basis-of-Design: Refer to Section 09 06 00 - Schedule of Finishes.

## **2.4 INSTALLATION MATERIALS**

- 2.4.1 Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by resilient sheet flooring manufacturer for applications indicated.
- 2.4.2 Adhesives: Water-resistant type recommended by flooring and adhesive manufacturers to suit resilient sheet flooring and substrate conditions indicated.
  - 2.4.2.1 Unless indicated otherwise, Provide one-part, solvent-free, low VOC acrylic adhesives.
  - 2.4.2.2 In wet locations, provide two-part, solvent-free, low VOC epoxy adhesives.
- 2.4.3 Heat-Welding Bead: Manufacturer's solid-strand product for heat welding seams. Colors: Selected by Consultant from manufacturer's full range to complement with flooring.
- 2.4.4 Integral Flash Cove Base (ICB-1): Refer to Section 09 06 00 - Schedule of Finishes.
- 2.4.5 Resilient Base: As specified in Section 09 65 13.
- 2.4.6 Moisture-Vapour Emission (MVE) Control System: ASTM F3010-qualified, fluid-applied, two-component, epoxy-resin, membrane-forming system; formulated for application on concrete substrates to reduce MVER to level required for

installation of floor coverings indicated and acceptable to manufacturers of floor covering products indicated, including adhesives.

2.4.6.1 MVE-Control System Capabilities: Capable of suppressing MVE without failure where installed on concrete that exhibits the following conditions:

- .1 Relative Humidity: outside of flooring manufacturer approved tolerances when tested according to ASTM F2170 using in situ probes.

2.4.6.2 Substrate Primer: Provide MVE-control system manufacturer's concrete-substrate primer if required for system indicated by substrate conditions.

2.4.6.3 Acceptable Products: Approved proprietary moisture control system recommended in writing by floor covering manufacturer and approved by Consultant in order to authenticate floor covering warranties.

2.4.6.4 Moisture tolerant adhesives may be used in lieu of MVE control systems, provided they are recommended in writing by manufacturer for slab conditions encountered at time of installation.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- 3.1.1 Verify actual site conditions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.
- 3.1.2 Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient sheet flooring.
- 3.1.3 Substrate tolerance: 3 mm in 3 m (1/8 inch in 10 feet), verified by straightedge per ASTM F710.
- 3.1.4 Commencement of construction activities implies acceptance of in-place conditions.

### **3.2 PREPARATION**

- 3.2.1 Prepare substrates according to resilient rubber flooring manufacturer's written instructions and ASTM F710 to ensure proper adhesion of flooring.
- 3.2.2 Remove substrate coatings and other substances that are incompatible with flooring adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by resilient rubber flooring manufacturer. Do not use solvents. Provide ICRI CSP 3 surface profile by shot blasting or as recommended by flooring manufacturer. Repair concrete as required.

- 3.2.3 Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- 3.2.4 Alkalinity and Adhesion Testing: Perform tests recommended by resilient rubber flooring manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 7 or more than 10 pH.
- 3.2.5 Moisture Testing:
  - 3.2.5.1 Perform relative humidity test using in-situ probes in accordance with ASTM F2170 prior to installation.
  - 3.2.5.2 Perform tests so that each test area does not exceed 93 sq. m (1000 sq. ft.).
  - 3.2.5.3 Perform at least three tests for the first 93 sq. m. (1000 sq. ft.) and an additional test for each additional 93 sq. m. (1000 sq. ft). Ensure test areas are evenly spaced.
  - 3.2.5.4 Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement, or other measurement approved in writing by manufacturer.
- 3.2.6 Do not install flooring until materials are the same temperature as space where they are to be installed.
- 3.2.7 At least 72 hours in advance of installation, move flooring and installation materials into spaces where they will be installed.
- 3.2.8 Sweep and vacuum clean substrates to be covered by flooring immediately before installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, and dust. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.3 APPLICATION OF MVE-CONTROL SYSTEM**

- 3.3.1 Apply MVE-control system to locations where moisture contents are above those recommended by manufacturer at time of installation.
- 3.3.2 Install MVE-control system according to ASTM F3010 and manufacturer's written instructions to produce a uniform, monolithic surface free of surface deficiencies such as pin holes, fish eyes, and voids.

### **3.4 INSTALLATION**

- 3.4.1 Installation, generally: Install work of this Section in strict accordance with manufacturer's written installation instructions and reviewed Shop Drawings. Supplement manufacturer's installation instructions with additional installation requirements specified in this Section to produce specified work results.
- 3.4.2 Scribe and cut flooring to butt neatly and tightly to vertical surfaces and permanent fixtures, including built-in furniture, cabinets, pipes, outlets, edgings, thresholds, door frames, and nosings.
- 3.4.3 Extend flooring into toe spaces, door reveals, closets, and similar openings.

- 3.4.4 Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on flooring as marked on substrates. Use chalk or other nonpermanent marking device.
- 3.4.5 Adhere flooring to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.
- 3.4.6 Minimize seams in resilient flooring and align with room geometry. Maintain consistent flooring direction.
- 3.4.7 Install integral cove wall base where shown on Drawings, including cove fillet support strip and top linoleum round cove cap edge trim. Use special heat welding rod and process at seams. Heat weld to Provide neat well fitted coved skirting as specified herein.
- 3.4.8 Seal joints between resilient sheet flooring cove bases and other surfaces, including wall surfaces with sealant bead as specified in Section 07 92 00.

### **3.5 PROTECTION**

- 3.5.1 Protect resilient sheet flooring from damage, soiling and contaminating substances resulting from construction activities or caused by work of other trades.
- 3.5.2 Where soiling or spills have occurred, remove spills and soiling from adjacent surfaces using cleaning procedures recommended in writing by affected material's manufacturer. Do not use materials or process that can damage finishes, surfaces, or construction.
- 3.5.3 Promptly replace resilient sheet flooring work damaged during construction that cannot be satisfactorily repaired.

### **3.6 CLEANING AND WASTE MANAGEMENT**

- 3.6.1 Cleaning: Maintain clean construction area at the end of each day. When activities of this Section are complete, remove materials, tools, equipment and rubbish.
- 3.6.2 Remove adhesive and other blemishes from surfaces immediately after completing resilient rubber flooring installation.
- 3.6.3 As soon as possible, but not less than 24 hours after completing resilient rubber flooring installation perform the following:
  - 3.6.3.1 Sweep and vacuum surfaces thoroughly.
  - 3.6.3.2 Damp-mop surfaces to remove marks and soil.
- 3.6.4 Waste Management and Disposal: sort waste for reuse, recycling, or disposal, as specified. Remove recycling bins and containers from site and dispose of contents at the appropriate waste disposal facilities.

**3.7 DEMONSTRATION AND TRAINING**

- 3.7.1 Engage manufacturer to demonstrate cleaning and maintenance procedures to Owner in accordance with requirements of Division 01. Review methods and procedures related to floor care and warranty requirements.

**END OF SECTION**

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## **PART 1      GENERAL**

### **1.1      GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.
- 1.1.2 Contractor is solely responsible for dividing the Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of the Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2      SUMMARY**

- 1.2.1 Provide labour, materials, products, equipment and services to complete the resinous matrix terrazzo flooring work specified herein. This includes, but is not necessarily limited, to:
  - 1.2.1.1 Thin-set, epoxy-resin terrazzo flooring and base.
  - 1.2.1.2 Auxiliary materials required for a complete installation
- 1.2.2 Related Requirements: Specifications throughout all Divisions of the Project shall be read as a whole and may be directly applicable to this Section. Related requirements provided below are for convenience purposes only.
  - 1.2.2.1 Section 07 92 00, Joint Sealants for sealants installed with terrazzo.

### **1.3      REFERENCES**

- 1.3.1 Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply.

### **1.4      DEFINITIONS**

- 1.4.1 Aggregate: Marble chips or other types of aggregate.

### **1.5      PREINSTALLATION MEETINGS**

- 1.5.1 Pre-installation Meetings: Schedule, and conduct pre-installation meeting at Project Site, in order to coordinate work of this Section, with work of related Subcontractors.
  - 1.5.1.1 Ensure attendance of Subcontractor performing work of this Section and representatives of manufacturers and fabricators involved in, or affected by, installation and coordination with other materials and installations that have preceded or will follow. Advise Consultant and Owner in advance of scheduled meeting dates.
  - 1.5.1.2 Agenda: Review progress of other construction activities and preparations for the particular activity under consideration.

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- 1.5.1.3 Record significant discussions, agreements, and disagreements, including required corrective measures and actions.
- 1.5.1.4 Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
- 1.5.1.5 Review methods and procedures related to terrazzo including, but not limited to, the following:
  - .1 Inspect and discuss condition of substrate and other preparatory work performed by other trades.
  - .2 Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - .3 Review special terrazzo designs and patterns.

## **1.6 SUBMITTALS**

- 1.6.1 General Requirements and Procedures for Submittals: in accordance with Section 01 33 00, Submittal Procedures.
- 1.6.2 Product Data: Submit manufacturer's instructions, printed product literature and data sheets for the resinous matrix terrazzo flooring work and include product characteristics, performance criteria, physical size, finish and limitations
- 1.6.3 Embodied Carbon / Environmental Product Declarations (EPDs): When available, submit product-specific or industry-wide EPDs conforming to ISO 14025 or other recognized environmental Product declaration framework meeting following criteria:
  - 1.6.3.1 EPD Scope: Must cover Cradle-to-Gate (A1 to A3) as a minimum.
  - 1.6.3.2 EPD Impact Categories: Must report Global Warming Potential (GWP) in form of unit of kgCO<sub>2</sub>e/declared unit as a minimum.
  - 1.6.3.3 Product Options: Give preference to Products with compliant documentation when choice is at Contractor's option.
- 1.6.4 Material Ingredient Disclosure: When available, submit documentation disclosing chemical inventory of materials to at least 0.1% (1000ppm) meeting following criteria:
  - 1.6.4.1 Standard: Health Product Declaration (HPD) Open Standard, Cradle to Cradle v2 (Basic level) or Cradle to Cradle v3 (Bronze level), International Living Future Institute (ILFI) Declare, or other approved material ingredient declaration framework.
  - 1.6.4.2 Product Options: Give preference to Products with compliant documentation when choice is at Contractor's option.
- 1.6.5 Low-Emitting Materials: For applicable Products specified or used for activities of this Section (i.e., site-applied coatings, adhesives, and sealants), submit certifications from third-party organizations indicating compliance with following:
  - 1.6.5.1 VOC Emissions: California Department of Public Health (CDPH) Standard Method v1.2–2017, using applicable exposure scenario.



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1.6.5.2 VOC Content: SCAQMD Rule 1113 (for paints and coatings) and SCAQMD Rule 1168 (for adhesives and sealants).

1.6.6 Shop Drawings: Include terrazzo installation requirements. Include plans, elevations, sections, component details, and attachments to other work.

1.6.7 Samples: Submit samples for each exposed product and for each colour and texture specified, 150 mm (6 inches) in size for following but not limited to:

1.6.7.1 Terrazzo: 150 mm (6 inch) square sample.

1.6.7.2 Integral Cove base: 150 mm (6 inch) square sample.

## **1.7 CLOSEOUT SUBMITTALS**

1.7.1 General Requirements and Procedures for Closeout Submittals: in accordance with Section 01 78 00, Closeout Submittals.

1.7.2 Operating and Maintenance Data: Submit care and maintenance instructions for resinous matrix terrazzo flooring to be included in building's operation and maintenance manual.

1.7.3 Warranty Documentation: Submit copy of extended warranties specified in this Section.

## **1.8 QUALITY ASSURANCE**

1.8.1 Manufacturer Qualifications: Provide Products for work of this Section by manufacturer with at least 5 years' experience manufacturing such materials.

1.8.2 Installer Qualifications: Engage an entity with at least five years' experience installing, erecting, or assembling work similar in material, design, and extent to that shown on Drawings and Schedules, and whose work has resulted in construction with a track record of successful in-service performance.

1.8.2.1 Engage an installer who is a contractor member of TTMAC.

1.8.2.2 Engage an installer who is certified in writing by terrazzo manufacturer as qualified to install manufacturer's products.

1.8.3 Source Limitations: Obtain primary terrazzo materials from single source from single manufacturer. Provide secondary materials including patching and fill material, joint sealant, and repair materials of type and from source recommended by manufacturer of primary materials.

1.8.4 Source Limitations for Aggregates: Obtain each colour, grade, type, and variety of granular materials from single source with resources to provide materials of consistent quality in appearance and physical properties.

1.8.5 Mockups: Construct mock-ups to verify selections made under submittals, demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

1.8.5.1 Build mockups for terrazzo including accessories.

.1 Size: Minimum 9 sq. m (100 sq. ft.) of typical poured-in-place flooring and base condition for each colour and pattern in locations directed by Consultant.

.2 Include base.

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- 1.8.5.2 Location: In-situ (i.e. first installation), as directed on site by Consultant.
- 1.8.5.3 Purpose: To set benchmarks for installation and to judge subsequent work. Maintain Mock-ups during construction in undisturbed condition.
- 1.8.5.4 Reviewed mock-ups: May become part of the completed work if undisturbed at the time of Substantial Performance of The work, provided they are undisturbed, and comply with requirements outlined in Contract Documents.

## **1.9 DELIVERY, STORAGE, AND HANDLING**

- 1.9.1 Deliver materials to Project site in supplier's original wrappings and containers, labeled with source's or manufacturer's name, material or product brand name, and lot number if any.
- 1.9.2 Store materials in their original, undamaged packages and containers, inside a well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.

## **1.10 FIELD CONDITIONS**

- 1.10.1 Environmental Limitations: Comply with manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting terrazzo installation.
- 1.10.2 Field Measurements: Verify actual dimensions of construction contiguous with precast terrazzo by field measurements before fabrication.
- 1.10.3 Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during terrazzo installation.
- 1.10.4 Close spaces to traffic during terrazzo application and for not less than 24 hours after application unless manufacturer recommends a longer period.
- 1.10.5 Control and collect water and dust produced by grinding operations. Protect adjacent construction from detrimental effects of grinding operations.

## **PART 2 PRODUCTS**

### **2.1 PERFORMANCE REQUIREMENTS**

- 2.1.1 TTMAC Standards: Comply with TTMAC's written recommendations for terrazzo type indicated on Drawings and Schedules unless more stringent requirements are specified.
- 2.1.2 FloorScore Compliance: Terrazzo floors shall comply with requirements of FloorScore Standard.
- 2.1.3 Low-Emitting Materials: Flooring system shall comply 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."

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## **2.2 EPOXY-RESIN TERRAZZO (TRZ-1)**

- 2.2.1 Epoxy-Resin Terrazzo: Two-component, solid colour, low VOC, low odour, self-priming, thin-set epoxy resin binder.
  - 2.2.1.1 Comply with Terrazzo, Tile and Marble Association of Canada (TTMAC) and the National Terrazzo and Mosaic Association (NTMA) standards for epoxy terrazzo.
- 2.2.2 Physical Properties:
  - 2.2.2.1 Thickness: Refer to Section 09 06 00 - Schedule of Finishes.
  - 2.2.2.2 Hardness: 84 Shore D Hardness as per ASTM D2240.
  - 2.2.2.3 Abrasion Resistance: 0.19 g loss (CS-17/1000 cycles/1000 g (2.2 lb.) as per ASTM DS4060
  - 2.2.2.4 Compressive Strength: > 68.94 MPa (> 10 000 psi) as per ASTM C579
  - 2.2.2.5 Tensile Strength in Flexure: 10,375 Mpa (~1,504,767 psi) as per ASTM C580
  - 2.2.2.6 Tensile Strength: 31.2 Mpa (~4530 psi) as per ASTM-D638
  - 2.2.2.7 Pull-Off Strength: > 2.5 MPa (> 363 psi) concrete failure as per ASTM D7234
  - 2.2.2.8 Indentation: < 1 % as per Mil D31134
  - 2.2.2.9 Water Absorption: 0.037 % as per ASTM C413
- 2.2.3 Aggregates: Comply with TTMAC gradation standards for mix indicated on Drawings and Schedules and contain no deleterious or foreign matter.
- 2.2.4 Topcoat: Refer to Section 09 06 00 - Schedule of Finishes.
- 2.2.5 Colour and Finish: Refer to Section 09 06 00 - Schedule of Finishes.
- 2.2.6 Basis-of-Design: Refer to Section 09 06 00 - Schedule of Finishes.

## **2.3 INTEGRAL COVE BASE**

- 2.3.1 Integral Flash Cove Base (ICB-2): Refer to Section 09 06 00 - Schedule of Finishes.

## **2.4 MISCELLANEOUS ACCESSORIES**

- 2.4.1 Strip Adhesive: Epoxy-resin adhesive recommended by adhesive manufacturer for this use.
- 2.4.2 Anchoring Devices:
  - 2.4.2.1 Precast Terrazzo: Provide mechanical anchoring devices as recommended by fabricator for proper anchorage and support of units for conditions of installation and support.
- 2.4.3 Patching and Fill Material: Terrazzo manufacturer's resinous product approved and recommended by manufacturer for application indicated.
- 2.4.4 Joint Compound: Terrazzo manufacturer's resinous product approved and recommended by manufacturer for application indicated.

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- 2.4.5 Resinous Matrix Terrazzo Cleaner: Chemically neutral cleaner with pH factor between 7 and 10 that is biodegradable, phosphate free, and recommended by sealer manufacturer for use on terrazzo type indicated.
- 2.4.6 Sealer: Manufacturer's standard.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- 3.1.1 Examine substrates and areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- 3.1.2 Proceed with installation only after unsatisfactory conditions, including levelness tolerances, have been corrected.

### **3.2 PREPARATION**

- 3.2.1 Clean substrates of substances, including oil, grease, and curing compounds, that might impair terrazzo bond. Provide clean, dry, and neutral substrate for terrazzo application.
- 3.2.2 Concrete Slabs:
  - 3.2.2.1 Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with terrazzo.
    - .1 Shot-blast surfaces with an apparatus that abrades the concrete surface, contains the dispensed shot within the apparatus, and recirculates the shot by vacuum pickup.
    - .2 Repair damaged and deteriorated concrete according to terrazzo manufacturer's written recommendations.
    - .3 Use patching and fill material to fill holes and depressions in substrates according to terrazzo manufacturer's written instructions.
- 3.2.3 Verify that concrete substrates are dry and moisture-vapour emissions are within acceptable levels according to manufacturer's written instructions.
  - 3.2.3.1 Moisture Testing: Perform tests indicated below.
    - .1 Calcium Chloride Test: Perform anhydrous calcium chloride test per ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapour emission rate of 1.36 kg of water/92.9 sq. m (3 lb of water/1000 sq. ft.) in 24 hours.
      - .1 Perform tests so that each test area does not exceed 18.6 sq. m (200 sq. ft.), and perform not less than two tests in each installation area and with test areas evenly spaced in installation areas.
    - .2 In-Situ Probe Test: Perform relative-humidity test using in-situ probes per ASTM F 2170. Proceed with installation only after

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substrates have a maximum 75 percent relative-humidity-level measurement.

- .3 Test Method: Test for moisture content by method recommended in writing by terrazzo manufacturer. Proceed with installation only after substrates pass testing.

3.2.4 Protect other work from water and dust generated by grinding operations. Control water and dust to comply with environmental protection regulations.

- 3.2.4.1 Erect and maintain temporary enclosures and other suitable methods to limit water damage and dust migration and to ensure adequate ambient temperatures and ventilation conditions during installation.

### **3.3 EPOXY-RESIN TERRAZZO INSTALLATION**

3.3.1 Comply with TTMAC's written recommendations for terrazzo and accessory installation.

3.3.2 Place, rough grind, grout, cure grout, fine grind, and finish terrazzo according to manufacturer's written instructions and TTMAC.

3.3.3 Installation Tolerance: Limit variation in terrazzo surface from level to 6.4 mm in 3 m (1/4 inch in 10 feet); noncumulative.

3.3.4 Ensure that matrix components and fluids from grinding operations do not stain terrazzo by reacting with divider and control-joint strips.

3.3.5 Delay fine grinding until heavy trade work is complete and construction traffic through area is restricted.

3.3.6 Flexible Reinforcing Membrane:

- 3.3.6.1 Prepare and prefill substrate cracks with membrane material.

- 3.3.6.2 Install membrane to produce full substrate coverage in areas to receive terrazzo.

- 3.3.6.3 Reinforce membrane with fiberglass scrim.

- 3.3.6.4 Prepare membrane according to manufacturer's written instructions before applying substrate primer.

3.3.7 Primer: Apply to terrazzo substrates according to manufacturer's written instructions.

### **3.4 REPAIR**

3.4.1 Cut out and replace terrazzo areas that evidence lack of bond with substrate. Cut out terrazzo areas in panels defined by strips and replace to match adjacent terrazzo, or repair panels according to TTMAC's written recommendations, as approved by Consultant.

### **3.5 CLEANING AND PROTECTION**

3.5.1 Cleaning:

- 3.5.1.1 Remove grinding dust from installation and adjacent areas.

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**ISSUED FOR:** TENDER

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- 3.5.1.2 Wash surfaces with cleaner according to TTMAC's written recommendations and manufacturer's written instructions; rinse surfaces with water and allow them to dry thoroughly.
- 3.5.2 Sealing:
  - 3.5.2.1 Seal surfaces according to TTMAC's written recommendations.
  - 3.5.2.2 Apply sealer according to sealer manufacturer's written instructions.
- 3.5.3 Protection: Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure that terrazzo is without damage or deterioration at time of Substantial Performance of the Work.

END OF SECTION

## **PART 1      GENERAL**

### **1.1      GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.
- 1.1.2 Contractor is solely responsible for dividing the Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of the Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2      SUMMARY**

- 1.2.1 Provide labour, materials, Products, equipment and services to complete the interior painting work specified herein. This includes, but is not necessarily limited, to:
  - 1.2.1.1 Painting of all interior exposed elements noted on Schedule of Finishes including following substrates:
    - .1 Steel.
    - .2 Galvanized metal.
    - .3 Aluminum (not anodized or otherwise coated).
    - .4 Wood.
    - .5 Gypsum board.
    - .6 Plaster.
  - 1.2.1.2 Where an item or surface is not specifically mentioned on Schedule of Finishes, and is not excluded, Provide same finish as similar adjacent materials or surfaces.
  - 1.2.1.3 Do not paint excluded components indicated herein.
- 1.2.2 Work Excluded:
  - 1.2.2.1 Do not paint pre-finished metal.
  - 1.2.2.2 Do not paint chrome, stainless steel, vinyl, plastic laminate and aluminum surfaces throughout unless specified otherwise.
  - 1.2.2.3 Do not paint interior surfaces of steel tanks and stacks.
  - 1.2.2.4 Do not paint sprayed fire-resistant materials.
  - 1.2.2.5 Do not paint equipment furnished completely prime- and finish painted by manufacturer unless required to have field painting over factory finish in order to produce common corporate colour as identified in Schedule of Finishes.
  - 1.2.2.6 Do not paint over ULC, FM or other code required labels or equipment identification plates.

- 1.2.3 Related Requirements: Specifications throughout all Divisions of the Project shall be read as a whole, and may be directly applicable to this Section.

### **1.3 REFERENCES**

- 1.3.1 Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply.

### **1.4 DEFINITIONS**

- 1.4.1 Gloss Level 1 (Flat or Matte): Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D523.
- 1.4.2 Gloss Level 2 (Velvet): Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D523.
- 1.4.3 Gloss Level 3 (Eggshell): 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D523.
- 1.4.4 Gloss Level 4 (Satin): 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D523.
- 1.4.5 Gloss Level 5 (Semi-gloss): 35 to 70 units at 60 degrees, according to ASTM D523.
- 1.4.6 Gloss Level 6 (Gloss): 70 to 85 units at 60 degrees, according to ASTM D523.
- 1.4.7 Exposed: This refers to items visible in completed Work. In case of closets, cabinets and drawers, it includes their interiors.
- 1.4.8 Surface Preparation: This refers to means of cleaning or treating of surface to be painted to ensure best possible bond between surface and painting applied. Surface preparation methods include, but are not limited to:
- 1.4.8.1 Ensure preparation and workmanship conforms to MPI Painting Manual requirements
- 1.4.8.2 Removal of surface contaminants that will affect performance of painting including but not limited to: oil, grease, salts, dust, dirt, rust, rust scale, mill scale, and old coatings where applicable.
- 1.4.8.3 Removal of surface imperfections including without limitations: weld spatter, sharp edges, burrs, silvers, laminations, pits, porosities and crevices.
- 1.4.8.4 Preparation of surfaces to Provide anchor profile or surface profile to improve mechanical bonding of coating to prepared surface by increasing surface area.
- 1.4.9 Dry location or area: A location not normally subject to dampness.
- 1.4.10 Damp/wet location or area: Location that is normally or periodically subject to condensation of moisture in, on, or adjacent to, Work of this Section. This includes location in which water or other liquid can drip, splash, or flow on or against Work of this Section. This includes, but is not limited to, showers, drying areas, change rooms, kitchen areas, washrooms, laundries and associated vestibules and corridors.



## **1.5 SUBMITTALS**

- 1.5.1 Submittals, generally: in accordance with Section 01 33 00, Submittal Procedures.
- 1.5.2 Product Data: Submit manufacturer's product characteristics, catalogue cuts, installation instructions and other relevant information for each material and product used for interior painting work specified in this Section.
- 1.5.3 Embodied Carbon / Environmental Product Declarations (EPDs): When available, submit product-specific or industry-wide EPDs conforming to ISO 14025 or other recognized environmental Product declaration framework meeting following criteria:
  - 1.5.3.1 EPD Scope: Must cover Cradle-to-Gate (A1 to A3) as a minimum.
  - 1.5.3.2 EPD Impact Categories: Must report Global Warming Potential (GWP) in form of unit of kgCO<sub>2</sub>e/declared unit as a minimum.
  - 1.5.3.3 Product Options: Give preference to Products with compliant documentation when choice is at Contractor's option.
- 1.5.4 Material Ingredient Disclosure: When available, submit documentation disclosing chemical inventory of materials to at least 0.1% (1000ppm) meeting following criteria:
  - 1.5.4.1 Standard: Health Product Declaration (HPD) Open Standard, Cradle to Cradle v2 (Basic level) or Cradle to Cradle v3 (Bronze level), International Living Future Institute (ILFI) Declare, or other approved material ingredient declaration framework.
  - 1.5.4.2 Product Options: Give preference to Products with compliant documentation when choice is at Contractor's option.
- 1.5.5 Low-Emitting Materials: For applicable Products specified or used for activities of this Section (i.e., site-applied coatings, adhesives, and sealants), submit certifications from third-party organizations indicating compliance with following:
  - 1.5.5.1 VOC Emissions: California Department of Public Health (CDPH) Standard Method v1.2–2017, using applicable exposure scenario.
  - 1.5.5.2 VOC Content: SCAQMD Rule 1113 (for paints and coatings) and SCAQMD Rule 1168 (for adhesives and sealants).
- 1.5.6 Drawdowns / Verification Samples: Submit selection and verification samples for exterior painting work requiring colour, texture, or design selection. Submit manufacturer's list of finishes or colour swatches for Consultant's selection.
  - .1 Submit full range colour sample chips to indicate where colour availability is restricted.
- 1.5.6.2 As a minimum submit samples of the following:
  - .1 Submit Samples (brushouts) on rigid backing, 200 mm (8 inches) square.
  - .2 Substrate: 3 mm (1/8 inch) plate steel or 13 mm (1/2 inch) plywood.
  - .3 Step coats on Samples to show each coat required for system.
  - .4 Label each coat of each Sample.

- .5 Label each Sample for location and application area.
- .6 Retain reviewed samples on-site to demonstrate acceptable standard of quality for appropriate on-site surface.

1.5.7 Product List: Submit product list in accordance with Division 01 for each product indicated on Drawings and Schedules, include the following:

- 1.5.7.1 Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
- 1.5.7.2 Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
- 1.5.7.3 Colour Numbers
- 1.5.7.4 MPI Environmentally Friendly Classification System Rating
- 1.5.7.5 Manufacturer's Safety Data Sheets (SDS)
- 1.5.7.6 VOC content.

## **1.6 CLOSEOUT SUBMITTALS**

- 1.6.1 Closeout Submittals, generally: in accordance with Section 01 78 00, Closeout Submittals.
- 1.6.2 Operating and Maintenance Data: Submit care and maintenance instructions for interior painting to be included in building operation and maintenance manual. Include the following cross-referenced to paint system and locations of application areas:
  - 1.6.2.1 Product name, type and use.
  - 1.6.2.2 Manufacturer's product number.
  - 1.6.2.3 Colour names and numbers
  - 1.6.2.4 MPI Environmentally Friendly classification system rating.
- 1.6.3 Warranty Documentation: Submit copy of extended warranties specified in this Section.

## **1.7 MAINTENANCE MATERIAL SUBMITTALS**

- 1.7.1 Extra Stock Materials: Deliver, for Owner's future maintenance use, additional materials equal to not less than two (2) % of each colour, pattern and type of interior painting installed.
  - 1.7.1.1 Identify each package with pertinent information, including manufacturer's name, Product name, series and colour.
  - 1.7.1.2 Unless indicated otherwise, maintenance materials submitted must be from same production run as installed materials.
  - 1.7.1.3 Store materials in locations directed by Owner.

## **1.8 QUALITY ASSURANCE**

- 1.8.1 Manufacturer Qualifications: Provide Products for work of this Section by manufacturer with at least 10 years' experience manufacturing such materials.
- 1.8.2 Installer Qualifications: Engage an entity with at least five years' experience installing, erecting, or assembling work similar in material, design, and extent to

that shown on Drawings and Schedules, with membership in good standing in MPI and whose work has resulted in construction with a track record of successful in-service performance.

- 1.8.3 Single Source Responsibility: Obtain primary materials for this Section from a single source by a single manufacturer, and secondary materials from sources recommended by manufacturers of primary materials.
- 1.8.1 Mock-Ups / First Installation Review: Apply mockups of each paint system directed on site and each colour and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
  - 1.8.1.1 Consultant will select one surface to represent surfaces and conditions for application of each paint system specified.
    - .1 Vertical and Horizontal Surfaces: Provide mock-ups of at least 9 sq. m (100 sq. ft.).
    - .2 Other Items: Consultant will designate items or areas required.
  - 1.8.1.2 Final approval of colour selections will be based on mockups.
    - .1 If preliminary colour selections are not approved, apply additional mockups of additional colours selected by Consultant at no added cost to Owner.
  - 1.8.1.3 Location: In-situ (i.e. first installation), as directed on site by Consultant.
  - 1.8.1.4 Purpose: To set benchmarks for installation and to judge subsequent work. Maintain Mock-ups during construction in undisturbed condition.
  - 1.8.1.5 Reviewed mock-ups: May become part of the completed work if undisturbed at the time of Substantial Performance of The work, provided they are undisturbed, and comply with requirements outlined in Contract Documents.

## **1.9 DELIVERY, STORAGE AND HANDLING**

- 1.9.1 Product Requirements, generally: in accordance with Section 01 61 00, Common Product Requirements.
- 1.9.2 Deliver, store and handle interior painting materials in accordance with manufacturer's written instructions.
- 1.9.3 Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- 1.9.4 Store materials in off-ground, in clean, dry, well-ventilated area.
- 1.9.5 Replace defective or damaged materials with new.
- 1.9.6 Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 7 deg C (45 deg F).
  - 1.9.6.1 Maintain containers in clean condition, free of foreign materials and residue.
  - 1.9.6.2 Remove rags and waste from storage areas daily.

- 1.9.6.3 Keep materials away from excessive heat or direct rays of the sun.
- 1.9.6.4 Remove used cloths from building at the end of every working shift and when not in use.
- 1.9.7 Fire Prevention:
  - 1.9.7.1 Prevent fire or explosion caused by improper storage of paints, solvents, rags, and similar items. Store hazardous materials in location and in manner approved by local fire authority.
  - 1.9.7.2 Post "No Smoking" signs in areas of storage and mixing. Provide and maintain CO<sub>2</sub> fire extinguishers of minimum 9 kg (20 lb) capacity.

## **1.10 FIELD CONDITIONS**

- 1.10.1 Environmental Restrictions: Do not deliver or install interior painting until building is enclosed, wet work is complete, and HVAC system is operational and will maintain temperature and relative humidity levels equal to occupancy levels for remainder of construction period.
- 1.10.2 Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 18 and 35 deg C (65 and 95 deg F). When required, Provide heating facilities to maintain ambient air and substrate temperatures above 10 deg C for 24 hours before, during and after paint application until paint has cured sufficiently.
- 1.10.3 Provide ventilation to remove odours, evaporating solvents and moisture. Maintain adequate ventilation at all times to control excessive humidity. Provide continuous ventilation for 7 days after completion of application of paint.
- 1.10.4 Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 3 deg C (5 deg F) above the dew point and rising; or to damp or wet surfaces.
- 1.10.5 Paint and finish work items in clean, dust-free, properly ventilated and adequately lit areas (minimum 100 lx (9.3 ft candles)).
- 1.10.6 Apply paint in occupied facilities during silent (off-) hours only. Schedule operations to approval of Owner such that painted surfaces will have dried and cured sufficiently before occupants are affected.

## **1.11 WARRANTY**

- 1.11.1 Extended warranty: Submit for Owner's review and acceptance, manufacturer's extended warranty in which manufacturer commits to repair or replace components of interior painting that fail within specified warranty period. Manufacturer's extended warranty is in addition to, and does not supersede, any other rights that Owner may have under Contract Documents.
  - 1.11.1.1 Warranty Period: Not less than 2 years from date of Substantial Performance of The work.

## **PART 2 PRODUCTS**

### **2.1 PERFORMANCE / DESIGN CRITERIA**

- 2.1.1 MPI Standards: Unless indicated otherwise, Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List." Functionally and aesthetically equivalent Products that do not meet requirements of MPI standards may be considered, provided they meet requirements of this Specification and are reviewed by the Consultant.
- 2.1.2 Unless otherwise specified herein, all painting work shall be in accordance with MPI Premium Grade finish requirements
- 2.1.3 Material Compatibility:
  - 2.1.3.1 Provide materials for use within each paint system that are compatible with one another and substrates indicated on Drawings and Schedules, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
  - 2.1.3.2 For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated on Drawings and Schedules.
- 2.1.4 Standard of Acceptance:
  - 2.1.4.1 Walls: no defects visible from a distance of 900 mm (3 ft) at 90 deg to surface when viewed using final lighting source.
  - 2.1.4.2 Soffits: no defects visible from floor at 45 deg to surface when viewed using final lighting source.
  - 2.1.4.3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.
- 2.1.5 VOC Content and Emissions:
  - 2.1.5.1 VOC Emissions: For applicable items in this Section, comply with CDPH Standard Method v1.2–2017 (CA Spec 01350) and ensure products are certified per UL 2818, SCS Global Gold, or equivalent.
  - 2.1.5.2 VOC Content Requirements: Wet-applied materials used in scope of this Section must conform to the following:
    - .1 Paints and Coatings: SCAQMD Rule 1113 or CARB SCM.
    - .2 Adhesives and Sealants: SCAQMD Rule 1168.
    - .3 Methylene chloride and perchloroethylene must not be intentionally added in paints, coatings, adhesives, or sealants.

### **2.2 COLOURS (PT-#)**

- 2.2.1 Refer to Section 09 06 00 - Schedule of Finishes.

### **2.3 GLOSS/SHEEN RATINGS**

- 2.3.1 Gloss level ratings of painted surfaces are as follows:
- 2.3.2 Unless indicated otherwise, gloss values for the work of this Section are as follows:

- 2.3.2.1 Walls: Eggshell or Satin.
- 2.3.2.2 Trim and Doors: Semi-gloss.
- 2.3.2.3 Ceilings: Flat.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- 3.1.1 Verify actual site conditions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.
- 3.1.2 Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
  - 3.1.2.1 Concrete: 12 percent.
  - 3.1.2.2 Masonry (Clay and CMU): 12 percent.
  - 3.1.2.3 Wood: 15 percent.
  - 3.1.2.4 Gypsum Board: 12 percent.
- 3.1.3 Gypsum Board Substrates: Verify that finishing compound is sanded smooth. Inspect surfaces to ensure there is no "nail popping", screw recessed are recessed, and surface is free of breaks and imperfections.
- 3.1.4 Wood Substrates: Inspect work to ensure surfaces are smooth, free from machine marks and that nailheads have been countersunk.
- 3.1.5 Spray-Textured Ceiling Substrates: Verify that surfaces are dry.
- 3.1.6 Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- 3.1.7 Proceed with coating application only after unsatisfactory conditions have been corrected.
  - 3.1.7.1 Application of coating indicates acceptance of surfaces and conditions.

### **3.2 PREPARATION**

- 3.2.1 Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated on Drawings and Schedules.
- 3.2.2 Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
  - 3.2.2.1 After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- 3.2.3 Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

- 3.2.3.1 Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated on Drawings and Schedules.
- 3.2.4 Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- 3.2.5 Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceed that permitted in manufacturer's written instructions.
- 3.2.6 Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:
  - 3.2.6.1 SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning."
- 3.2.7 Metal Stacks, Breeching, Piping: Blast clean to 0.037 mm to 0.050 mm (1.5 - 2 mil) profile using grit abrasive to SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
- 3.2.8 Decorative Metals: Blast clean removing minimum 0.037 mm to 0.050 mm (1.5 - 2 mil) scale, rust and other foreign matter from metal surface using grit abrasive to SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
- 3.2.9 Galvanized Steel:
  - 3.2.9.1 Hot Dipped Galvanized Steel (Unweathered): Allow to weather minimum of 26 weeks and clean to SSPC-SP16. Remove silicates or similar surface treatments or any deposits of white rust by sanding or similar abrasive methods (bronze wool).
    - .1 Use of acetic acid to prepare galvanized surfaces is not acceptable.
    - .2 Clean chromate passivated galvanized metal surface contamination by washing with appropriate chemical solution compatible with finish specified such as MPI #25.
  - 3.2.9.2 Galvanized Steel (Weathered): Remove dust, dirt, grease, oxides and other foreign material and clean to SSPC-SP16 specified herein prior to coating.
  - 3.2.9.3 Galvanized Steel (Pre-Treated - Non-Crystal Appearance): Follow manufacturer's recommendations for preparation, priming and coating of pre-treated galvanized steel.
- 3.2.10 Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- 3.2.11 Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- 3.2.12 Aluminum Substrates: Remove loose surface oxidation.
- 3.2.13 Wood Substrates:

- 3.2.13.1 Scrape and clean knots, and apply coat of knot sealer before applying primer.
- 3.2.13.2 Sand surfaces that will be exposed to view, and dust off.
- 3.2.13.3 Prime edges, ends, faces, undersides, and backsides of wood.
- 3.2.13.4 After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.
- 3.2.14 Cotton or Canvas Insulation Covering Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.
- 3.2.15 Plastic (PVC or similar): Solvent clean to SSPC-SP1. Sand lightly with No. 120 sandpaper and remove dust.

### **3.3 MIXING**

- 3.3.1 Mix and prepare paint materials in accordance with manufacturer's directions for particular material and coat to be applied. If reducing is required, do so in accordance with recommendations of manufacturer for particular material and coat.
- 3.3.2 Tint undercoats and each finish coat with correct type colours, for identification of each succeeding coat.
- 3.3.3 Clean containers used for storage, mixing and application of materials free of foreign materials and residue.

### **3.4 APPLICATION**

- 3.4.1 Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."
  - 3.4.1.1 Use applicators and techniques suited for paint and substrate indicated on Drawings and Schedules.
  - 3.4.1.2 Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with Primer (1ct): only.
  - 3.4.1.3 Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
  - 3.4.1.4 Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
  - 3.4.1.5 Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- 3.4.2 Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match colour of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- 3.4.3 If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, colour, and appearance.



- 3.4.4 Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and colour breaks.

### **3.5 EQUIPMENT**

- 3.5.1 Read Divisions 21, 22, 23 and Division 26 for their requirements and further instruction on painting Mechanical and Electrical work and perform such work under supervision of respective Mechanical and Electrical Divisions.
- 3.5.2 Paint finished area exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as indicated.
- 3.5.3 Do not paint over nameplates.
- 3.5.4 Keep sprinkler heads free of paint.
- 3.5.5 Paint inside of ductwork where visible behind grilles, registers and diffusers with primer and one coat of matt black paint.
- 3.5.6 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.
- 3.5.7 Do not paint interior transformers and substation equipment.
- 3.5.8 Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
- 3.5.8.1 Paint the following work where exposed in Boiler room, mechanical and electrical rooms and similar equipment rooms:
- .1 Exposed conduits, hangers, ductwork and other mechanical and electrical equipment.
  - .2 Equipment, including panelboards and switch gear.
  - .3 Uninsulated metal piping.
  - .4 Uninsulated plastic piping.
  - .5 Pipe hangers and supports.
  - .6 Metal conduit.
  - .7 Plastic conduit.
  - .8 Tanks that do not have factory-applied final finishes.
  - .9 Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
- 3.5.8.2 Paint the following work where exposed in occupied spaces:
- .1 Equipment, including panelboards.
  - .2 Uninsulated metal piping.
  - .3 Uninsulated plastic piping.
  - .4 Pipe hangers and supports.
  - .5 Metal conduit.

- .6 Plastic conduit.
- .7 Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
- .8 Other items as directed by Consultant.
- 3.5.8.3 Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.
- 3.5.8.4 Other unfinished areas: leave exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish and touch up scratches and marks.

### **3.6 EXISTING SPACES**

- 3.6.1 Refinish existing surfaces of rooms or areas which have been damaged, altered or otherwise affected by work. Finish "new" work occurring in these spaces unless otherwise specified. Use same procedure as for new work but primer (or filler, stain and sealer in case of varnish finish) may be omitted. Prepare existing surfaces as specified herein. Ensure finish matches previous finish.
- 3.6.2 Paint or repaint rooms or areas where noted on Schedule of Finishes.
- 3.6.3 Repaint surfaces entirely between changes of plane. Extend painting to a suitable boundary to avoid a "patched" effect. Sand, wire-brush, or scrape such existing finished surfaces to remove loose paint and to reduce gloss. Also clean existing films of dirt, grease or wax. If metallic surfaces are rusted, remove loose scale to provide a firm surface. Patch and sand cracks and other imperfections.
- 3.6.4 Provide paint to interior existing spaces affected by alterations in accordance with following:
  - 3.6.4.1 Paint walls to nearest inside and outside corners for full wall height.
  - 3.6.4.2 Paint columns floor to ceiling.
  - 3.6.4.3 Paint full ceilings to nearest wall or bulkhead.
  - 3.6.4.4 Unless indicated otherwise match existing colour.
  - 3.6.4.5 Where Schedule of Finishes indicates existing and/or new wall finishes to be painted, existing surfaces such as, existing door and frames, mechanical supply and return air grilles (both on walls and ceilings), access doors and electrical panels which have been previously painted are to be painted to provide a complete and finished room. ]

### **3.7 FIELD QUALITY CONTROL**

- 3.7.1 Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
  - 3.7.1.1 Contractor shall touch up and restore painted surfaces damaged by testing.
  - 3.7.1.2 If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

### **3.8 PROTECTION**

- 3.8.1 Protect interior painting from damage, soiling and contaminating substances resulting from construction activities or caused by work of other trades.
- 3.8.2 Where soiling or spills have occurred, remove spills and soiling from adjacent surfaces using cleaning procedures recommended in writing by affected material's manufacturer. Do not use materials or process that can damage finishes, surfaces, or construction.
- 3.8.3 Promptly replace interior painting work damaged during construction that cannot be satisfactorily repaired.
- 3.8.4 Protect finished areas subject to contact during drying by posting "Wet Paint" signs and barring from traffic where necessary.

### **3.9 CLEANING AND WASTE MANAGEMENT**

- 3.9.1 After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- 3.9.2 Cleaning: Maintain clean construction area at the end of each day. When activities of this Section are complete, remove materials, tools, equipment and rubbish.
- 3.9.3 Waste Management and Disposal: sort waste for reuse, recycling, or disposal, as specified. Remove recycling bins and containers from site and dispose of contents at the appropriate waste disposal facilities.

### **3.10 INTERIOR SUBSTRATE PAINTING SCHEDULE**

- 3.10.1 Walls/Ceilings - Institutional Low-Odor/VOC Latex System (Standard Performance / Latex)
  - 3.10.1.1 Material Tag: This paint system is noted as "PT-#" on Schedule of Finishes.
  - 3.10.1.2 Gypsum Board Substrates:
    - .1 Sherwin Williams:
      - .1 Primer (1ct): "ProMar 200 Zero VOC Interior Latex Primer, 0 g/L"
      - .2 Finish Coats (2 cts): "ProMar 200 Zero VOC, 0 g/L"
  - 3.10.1.3 Fiberglass-Mat Faced Gypsum Board Substrates:
    - .1 Sherwin Williams:
      - .1 Primer (1ct): "Builders Solution, <50 g/L"
      - .2 Seal Coat: Prep Rite Pro Block Primer-Sealer, 0 g/L
      - .3 Finish Coats (2 cts): "ProMar 200 Zero VOC, 0 g/L"
  - 3.10.1.4 Concrete Substrates
    - .1 Sherwin Williams:
      - .1 Primer (1ct): "Loxon Concrete & Masonry Primer, <100 g/L"
      - .2 Finish Coats (2 cts): "ProMar 200 Zero VOC, 0 g/L"
- 3.10.2 Painted Metal:

3.10.2.1 Steel Substrates (Non-galvanized) - Doors, Frames and Miscellaneous Metals - Water-Based Light Industrial Coating System:

.1 Sherwin Williams:

- .1 Primer (1ct): "Pro Industrial Pro-Cryl Universal Primer, <50 g/L"
- .2 Finish Coats (2 cts): "Pre-catalyzed Waterbased Epoxy, <50 g/L"

3.10.2.2 Galvanized-Metal Substrates - Doors, Frames and Miscellaneous Metals - Institutional Low-Odor/VOC Latex System:

.1 Sherwin Williams:

- .1 Primer (1ct): "Pro Industrial Pro-Cryl Universal Primer, <50 g/L"
- .2 Finish Coats (2 cts): "Pre-catalyzed Waterbased Epoxy, <50 g/L"

3.10.2.3 Metal Exposed Ceilings and Decking (including bar joists) above 6096 mm (20' – 0") – Water-based Dry Fall

.1 Sherwin Williams:

- .1 Primer (1ct): Shop-applied Q.D primer (MPI #275).
- .2 Finish Coats (2 cts): "Low VOC Waterborne Acrylic Dryfall, <50 g/L"

3.10.2.4 Aluminum (Not Anodized or Otherwise Coated) Substrates:

.1 Sherwin Williams:

- .1 Primer (1ct): "Pro Industrial Pro-Cryl Universal Primer, <50 g/L"
- .2 Finish Coats (2 cts): "Pro Industrial Zero VOC Acrylic, 0 g/L"

3.10.3 Painted Wood:

3.10.3.1 Sherwin Williams:

- .1 Primer (1ct): "Prep Rite Pro Block Primer-Sealer, 0 g/L"
- .2 Finish Coats (2 cts): "Pro Industrial Zero VOC Acrylic, 0 g/L"

**END OF SECTION**

## **PART 1 GENERAL**

### **1.1 GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.
- 1.1.2 Contractor is solely responsible for dividing the Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of the Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2 SUMMARY**

- 1.2.1 Provide labour, materials, products, equipment and services to complete the VISUAL DISPLAY SURFACES work specified herein. This includes, but is not necessarily limited, to:
  - 1.2.1.1 Glass Markerboards.
- 1.2.2 Related Requirements: Specifications throughout all Divisions of the Project shall be read as a whole, and may be directly applicable to this Section. Related requirements provided below are for convenience purposes only.
  - 1.2.2.1 Division 26 for wiring and other electrical work associated with power-operated, visual display surfaces.

### **1.3 REFERENCES**

- 1.3.1 Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply.

### **1.4 DEFINITIONS**

- 1.4.1 Tackboard: Framed or unframed, tackable, visual display board assembly.
- 1.4.2 Visual Display Board Assembly: Visual display surface that is factory fabricated into composite panel form, either with or without a perimeter frame; includes chalkboards, markerboards, and tackboards.
- 1.4.3 Visual Display Surface: Surfaces that are used to convey information visually, including surfaces of chalkboards, markerboards, tackboards, and surfacing materials that are not fabricated into composite panel form but are applied directly to walls.

### **1.5 SUBMITTALS**

- 1.5.1 Submittals, generally: in accordance with Section 01 33 00, Submittal Procedures.

- 1.5.2 Product Data: Submit manufacturer's product characteristics, catalogue cuts, installation instructions and other relevant information for each material and product used for visual display surfaces work specified in this Section.
- 1.5.3 Shop Drawings: Submit Shop Drawings in accordance with Division 01 for visual display surfaces. Include plans, elevations, sections, details, and attachments to other work.
  - 1.5.3.1 Show locations of panel joints.
  - 1.5.3.2 Show locations of special-purpose graphics for visual display surfaces.
  - 1.5.3.3 Include sections of typical trim members.
- 1.5.1 Embodied Carbon / Environmental Product Declarations (EPDs): When available, submit product-specific or industry-wide EPDs conforming to ISO 14025 or other recognized environmental Product declaration framework meeting following criteria:
  - 1.5.1.1 EPD Scope: Must cover Cradle-to-Gate (A1 to A3) as a minimum.
  - 1.5.1.2 EPD Impact Categories: Must report Global Warming Potential (GWP) in form of unit of kgCO<sub>2</sub>e/declared unit as a minimum.
  - 1.5.1.3 Product Options: Give preference to Products with compliant documentation when choice is at Contractor's option.
- 1.5.2 Material Ingredient Disclosure: When available, submit documentation disclosing chemical inventory of materials to at least 0.1% (1000ppm) meeting following criteria:
  - 1.5.2.1 Standard: Health Product Declaration (HPD) Open Standard, Cradle to Cradle v2 (Basic level) or Cradle to Cradle v3 (Bronze level), International Living Future Institute (ILFI) Declare, or other approved material ingredient declaration framework.
  - 1.5.2.2 Product Options: Give preference to Products with compliant documentation when choice is at Contractor's option.
- 1.5.3 Low-Emitting Materials: For applicable Products specified or used for activities of this Section (i.e., site-applied coatings, adhesives, and sealants), submit certifications from third-party organizations indicating compliance with following:
  - 1.5.3.1 VOC Emissions: California Department of Public Health (CDPH) Standard Method v1.2–2017, using applicable exposure scenario.
  - 1.5.3.2 VOC Content: SCAQMD Rule 1113 (for paints and coatings) and SCAQMD Rule 1168 (for adhesives and sealants).
- 1.5.4 Samples for Initial Selection: Submit samples for initial selection in accordance with Division 01 for each type of visual display surface indicated., for units with factory-applied colour finishes.
- 1.5.5 Include accessory Samples to verify colour selected.
- 1.5.6 Warranties: Sample of special warranties.

## **1.6 QUALITY ASSURANCE**

- 1.6.1 Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of motor-operated, sliding visual display units required for this Project.

- 1.6.2 Source Limitations: Obtain visual display surfaces from single source from single manufacturer.

## **1.7 DELIVERY, STORAGE, AND HANDLING**

- 1.7.1 Deliver factory-built visual display surfaces, including factory-applied trim where indicated, completely assembled in one piece without joints, where possible. If dimensions exceed maximum manufactured panel size, provide two or more pieces of equal length as acceptable to Consultant. When overall dimensions require delivery in separate units, prefit components at the factory, disassemble for delivery, and make final joints at the site.
- 1.7.2 Store visual display surfaces vertically with packing materials between each unit.

## **1.8 PROJECT CONDITIONS**

- 1.8.1 Environmental Limitations: Do not deliver or install visual display surfaces until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above ceilings is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
- 1.8.2 Field Measurements: Verify actual dimensions of construction contiguous with visual display surfaces by field measurements before fabrication.
  - 1.8.2.1 Allow for trimming and fitting where taking field measurements before fabrication might delay the Work.

## **1.9 WARRANTY**

- 1.9.1 Special Warranty for Electronic Markerboards: Manufacturer's standard form in which manufacturer agrees to repair or replace electronic markerboards that fail in materials or workmanship within specified warranty period.
  - 1.9.1.1 Warranty Period: Two years from date of Substantial Performance of the Work.

## **PART 2 PRODUCTS**

### **2.1 MAGNETIC MARKERBOARDS (WB-1)**

- 2.1.1 Markerboard: Porcelain Enameled Steel Sheet; to ASTM A424/A424M, Type I, Commercial Steel, manufactured in accordance with Porcelain Enamel Institute's PEI-1002 specification consisting of sandwich-type construction of face panel with fired-on vitreous finish, core, and balancing rear sheet.
  - 2.1.1.1 Face Sheet Writing Surface: manufacturer's standard
  - 2.1.1.2 Core Material: manufacturer's standard
  - 2.1.1.3 Backing: manufacturer's standard
- 2.1.2 Trim: Aluminum trim in profile indicated.
- 2.1.3 Exposed Frame Width: 3 mm (1/8 inch) with reveal.
  - 2.1.3.1 Corner Style: Square.

- 2.1.4 Size: Refer to Section 09 06 00 – Schedule of Finishes.
- 2.1.5 Colour: Refer to Section 09 06 00 – Schedule of Finishes.
- 2.1.6 Basis-of-Design: Refer to Section 09 06 00 – Schedule of Finishes.

## **2.2 GENERAL FINISH REQUIREMENTS**

- 2.2.1 Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- 2.2.2 Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- 2.2.3 Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- 3.1.1 Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances, surface conditions of wall, and other conditions affecting performance of the Work.
- 3.1.2 Examine roughing-in for electrical power systems to verify actual locations of connections before installation of motor-operated, sliding visual display units.
- 3.1.3 Examine walls and partitions for proper preparation and backing for visual display surfaces.
- 3.1.4 Examine walls and partitions for suitable framing depth where sliding visual display units will be installed.
- 3.1.5 Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 PREPARATION**

- 3.2.1 Comply with manufacturer's written instructions for surface preparation.
- 3.2.2 Clean substrates of substances that could impair the performance of and affect the smooth, finished surfaces of visual display boards, including dirt, mold, and mildew.
- 3.2.3 Prepare surfaces to achieve a smooth, dry, clean surface free of flaking, unsound coatings, cracks, defects, projections, depressions, and substances that will impair bond between visual display surfaces and wall surfaces.
- 3.2.4 Prepare substrates indicated to receive visual display wall covering as required by manufacturer's written instructions to achieve a smooth, dry, clean, structurally sound surface that is uniform in colour.
- 3.2.5 Prepare recesses for sliding visual display units as required by type and size of unit.



**3.3 INSTALLATION, GENERAL**

- 3.3.1 General: Install visual display surfaces in locations and at mounting heights indicated on Drawings, or if not indicated, at heights indicated below. Keep perimeter lines straight, level, and plumb. Provide grounds, clips, backing materials, adhesives, brackets, anchors, trim, and accessories necessary for complete installation.
- 3.3.2 Attach concealed clips, hangers, and grounds to wall surfaces and to visual display boards with fasteners at not more than 400 mm (16 inches) o.c. Secure both top and bottom of boards to walls.

**3.4 CLEANING AND PROTECTION**

- 3.4.1 Clean visual display surfaces according to manufacturer's written instructions. Attach one cleaning label to visual display surface in each room.
- 3.4.2 Touch up factory-applied finishes to restore damaged or soiled areas.
- 3.4.3 Cover and protect visual display surfaces after installation and cleaning.

END OF SECTION

## **PART 1      GENERAL**

### **1.1      GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.
- 1.1.2 Contractor is solely responsible for dividing the Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of the Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2      SUMMARY**

- 1.2.1 Provide labour, materials, products, equipment and services to complete the Headwalls work specified herein. This includes, but is not necessarily limited, to:
  - 1.2.1.1 Non-secure medical service units.
  - 1.2.1.2 Auxiliary materials required for complete installation.
- 1.2.2 Related Requirements: Specifications throughout entirety of Divisions of this Project are directly applicable to this Section, and this Section is directly applicable to them.

### **1.3      REFERENCES**

- 1.3.1 Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply.

### **1.4      ADMINISTRATIVE REQUIREMENTS**

- 1.4.1 Pre-Installation Meetings: Prior to starting work of this Section, convene a pre-installation meeting at Project site to review Project requirements and site conditions with pertinent parties. Conform to requirements of Section 01 31 19.

### **1.5      SUBMITTALS**

- 1.5.1 Product Data: Submit manufacturer's literature and data sheets for each type of material provided under this Section for Project in accordance with requirements of Section 01 33 00. Ensure data sheets provide required information including detailed instructions for installing as well as maintaining, preserving and keeping materials in clean and safe conditions. Provide adequate warning of maintenance practices or cleaning agents detrimental to specified materials.
- 1.5.2 Material Safety Data Sheets: Submit MSDS for inclusion in Operation and Maintenance Manual without limitations for adhesives, sealants and any other material later designated by Consultant.
- 1.5.3 Shop Drawings: Submit Shop Drawings of the work of this Section in accordance with Section 01 33 00.

- 1.5.3.1 Include sufficient information, clearly presented, to determine compliance with construction documents.
- 1.5.3.2 Include electrical ratings, dimensions, mounting details, front view, side view, equipment and device arrangement, wiring diagrams, material, and connection diagrams.
- 1.5.3.3 Submit configuration drawings showing devices, including nurse call, medical gases, electrical receptacles and switches.
- 1.5.3.4 In addition to minimum requirements indicate following:
  - .1 Medical gas connection layout and termination.
  - .2 Electrical connection layout.
- 1.5.4 Certifications: Submit in accordance with Section 01 33 00.
  - 1.5.4.1 Submit certification by manufacturer that equipment conforms to requirements of Contract Documents.
  - 1.5.4.2 Submit certification by installer that equipment has been properly installed, adjusted, and tested in accordance with manufacturer's recommendations.
- 1.5.5 Regulatory Requirements Submittals: Submit following in accordance with Section 01 33 00:
  - 1.5.5.1 Submit system testing and inspection reports as specified.
  - 1.5.5.2 Submit CSA Certification or local approvals for site wiring of systems as specified.
  - 1.5.5.3 Submit written test results and certification of medical gas systems tests as specified.
- 1.5.6 Samples: Submit samples in accordance with Section 01 33 00. Submit following samples in sizes indicated:
  - 1.5.6.1 Aluminum extrusions minimum 300 mm (12") long.
  - 1.5.6.2 Plastic laminates minimum 300 mm (12") square.
- 1.5.7 Closeout Submittals: Prior to the final inspection, deliver four (4) copies of the following to Contractor:
  - 1.5.7.1 Complete maintenance and operating manuals including wiring diagrams, technical data sheets, and information for ordering replacement parts:
  - 1.5.7.2 Include complete "As built" diagrams indicating all items of equipment, their interconnecting wiring and interconnecting piping.
  - 1.5.7.3 Include complete diagrams of the internal wiring for each of the items of equipment, including "As built" revisions of the diagrams.
  - 1.5.7.4 Identify terminals on the wiring diagrams to facilitate installation, maintenance and operation.

## **1.6 QUALITY ASSURANCE**

- 1.6.1 Applicator Qualifications: Provide work of this Section, executed by competent fabricators and installers with minimum of 5 years' experience in application of

Products, systems and assemblies specified and with approval and training of Product manufacturers.

**1.6.2 Welding:**

1.6.2.1 Provide welding in accordance with CSA W59-M performed by a fabricator and mechanics fully approved by the Canadian Welding Bureau as specified herein.

1.6.2.2 Ensure fabricator is fully certified by Canadian Welding Bureau for fusion welding of steel structures to CSA W47.1 and for fusion welding of aluminum to CSA W47.2.

1.6.3 Licensed Professionals: Employ a professional structural engineer carrying a minimum \$2,000,000.00 professional liability insurance and registered in the Province of Ontario.

1.6.4 Inspection and Testing: Refer to Division 01 for following items and services supplied as part of a cash allowance:

1.6.4.1 Inspection and testing of medical gas systems.

1.6.4.2 Inspection and testing of electrical inter-wiring.

**1.6.5 Mock-Ups:**

1.6.5.1 Conform to requirements of Section 01 45 00. Submit 1 transportable Mock-Up in accordance with following requirements:

.1 Minimum Size: 300 mm x 300 mm x 300 mm (12" x 12" x 12")

.2 Maximum Size: 450 mm x 450 mm x 450 mm (18" x 18" x 18")

1.6.5.2 Prior to production, construct 1 site Mock-Up for Consultant's review and acceptance and Install where directed by Consultant.

.1 one patient strip headwall unit.

1.6.6 Single Source Responsibility: Ensure primary materials provided in this Section are obtained from 1 source by a single manufacturer and secondary materials are obtained from sources recommended by primary materials manufacturers.

**1.7 WARRANTY**

1.7.1 Warrant the Work of this Section (labour and materials) against defects and deficiencies for a period of 2 years from Full Service Commencement date in accordance with conditions of the Contract. Promptly correct defects or deficiencies which become apparent within warranty period, to satisfaction of Consultant and at no expense to Contractor.

**PART 2 PRODUCTS**

**2.1 MANUFACTURERS**

2.1.1 Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

2.1.1.1 Amico Corporation; [www.amico.com](http://www.amico.com)

2.1.1.2 Class 1 Inc., [www.class1inc.com](http://www.class1inc.com)

2.1.1.3 Interspec Systems Limited.; [www.interspecsystems.com](http://www.interspecsystems.com)

2.1.1.4 Medical Design; <https://medicaldesign.ca/>

2.1.2 Substitution Limitations: This Specification is based on Amico Corporation's Products. Comparable Products from manufacturers listed herein, offering functionally, aesthetically equivalent products, as judged solely by Consultant, will be considered provided they meet the requirements of this Specification.

## **2.2 REGULATORY REQUIREMENTS:**

2.2.1 Fire-Test-Response Characteristics: Flame-spread index shall be in accordance with National Building Code of Canada requirements when tested according to CAN/ULC-S102 or ASTM E84.

## **2.3 DESIGN AND PERFORMANCE REQUIREMENTS**

2.3.1 Provide units complete with structural frames, access panels, electrical outlets, electrical back boxes, light switches, wiring, grounding, medical gas lines and medical gas outlets, vacuum, medical air and oxygen outlets.

2.3.2 Make provision (i.e. rough-in boxes and conduits) for communication stations (nurse calls), accessory rails, monitor mounting rails, blank for future service and data device and wire. Provide rough-in boxes and conduit.

2.3.3 Ensure patient bed service wall system is listed by UL and ULC. Provide Products conforming to following standards and regulations:

2.3.3.1 CSA Z7396.1,

2.3.3.2 NFPA-99c,

2.3.3.3 CSA C22

2.3.3.4 NFPA 70

2.3.4 Connections:

2.3.4.1 Provide patient bed service wall system with integrated raceways and single area connection for electrical wiring for each electrical outlet or device (critical, emergency normal, low voltage/communication etc.) as well as dimmer switches.

2.3.4.2 Locate electrical termination as indicated on Drawings. Ensure connections are factory installed and manifolded for single-point connection to building services as indicated on reviewed Shop Drawings.

2.3.4.3 Provide medical gas piping hard-piped and brazed to single point of connection.

2.3.4.4 Provide data wiring connected to device junction box via conduit or raceway.

2.3.4.5 Coordinate with electrical trades for provision and wiring of communication station device (if required).

2.3.5 Fascia: Where required, Provide removable type at all location to provide access for easy installation and maintenance of headwall services.

- 2.3.6 Welding of any structural component related to work of this Section shall be executed by a fabricator having certification in accordance with Division 3, CSA W47.1.

## **2.4 MATERIALS**

- 2.4.1 Aluminum Sheet: ASTM B209 (ASTM B209M), Alloy 6061-T6.
- 2.4.2 Aluminium Extrusions: ASTM B221 (ASTM B221M), Alloy 6063-T6.
- 2.4.3 Structural Shapes, Plates, Etc.: New material conforming to CSA G40.20 and CSA G40.21, Grade 300W.
- 2.4.4 Uncoated, Cold-Rolled Steel Sheet: ASTM A1008/A1008M, structural steel, Grade 170, new material, unless another grade is required by design loads; exposed.
- 2.4.5 Steel studs: ASTM C645, minimum base-metal thickness, 43 mils (0.0428" – 1.087 mm – 18 ga – Yellow)
- 2.4.6 Provide electrical outlet colours to match project requirements.
- 2.4.7 Provide gas outlet cover plates to match articulating arm vendor outlets.

## **2.5 MANUFACTURED UNITS (HDW-#)**

- 2.5.1 Non-Secure Medical Service Units
- 2.5.1.1 Configuration: Refer to Drawings.
- 2.5.1.2 Mounting: Surface Mounted. Refer to Drawings for specific applications.
- 2.5.1.3 Sizes: As indicated on Drawings
- 2.5.1.4 Construction: Factory-assembled modular units with concealed fasteners.
- 2.5.1.5 Finish: As selected by Consultant from manufacturer's full range.
- 2.5.1.6 Enclosure: extruded anodized aluminum alloy sections. Provide 16 gage full-length galvanized steel backing plate, complete with knock out locations for each individual power source and medical gas termination.
- 2.5.1.7 Integrated Accessory Rails: Design rail system with no sharp edges to meet infection prevention and control requirements and to provide easy access for cleaning purposes.
- .1 Single tier headwall system: *Provide 2* accessory channels integrated into aluminum extrusion assembly with no mechanical screws used to affix rail to headwall. Finish: clear etched anodized finish.
- .2 Finish: clear etched anodized finish.
- 2.5.1.8 Fascia: Aluminum strips with laminated with plastic laminate as specified herein.
- 2.5.1.9 Covers and End caps (as applicable):
- .1 Top and bottom cover panels: manufactured from powder coated extruded aluminum

- .2 End caps: manufactured from injection molded ABS fire retardant plastic.
- 2.5.1.10 Service Chase: ASTM B221, Extruded 6063-T5 aluminum with passage space for conduit and medical gas piping. Fronts: Plastic laminate as specified herein.
- 2.5.1.11 Basis-of-Design:
  - .1 Single Tier – Surface Mounted: "Serenity Series Surface Mounted Flatwall - Vertical" by Amico or approved equivalent.

## **2.6 COMPONENTS**

- 2.6.1 Ensure components specified in this Section are factory installed and tested.
- 2.6.2 Medical Gas Piping and Medical Gas Outlets: Location, style and type as recommended by manufacturer. Ensure each outlet, piping and manifold are factory-tested to pass a 24 hour standing pressure test.
  - 2.6.2.1 Medical Gas piping: Type L copper pipe.
  - 2.6.2.2 Medical Gas Manifold: Medical gas distribution supplied by pipe drops to single point connection above unit as indicated on reviewed Shop Drawings. Provide all medical gas outlets and piping brazed and tested in accordance with CSA Z7396.1 and NFPA 99c.
- 2.6.3 Electrical Requirements:
  - 2.6.3.1 Wiring: Wire for standard and critical branch power circuits: #10 or #12 (as specified) type RW90 stranded copper wire, 600 volt, with heat resistant thermoplastic insulation for hot (black) and neutral (white).
  - 2.6.3.2 Grounds: #10 RW90 stranded copper wire (green).
  - 2.6.3.3 Grounding and Bonding: All ground conductors to be installed in conduit or raceway. Each power receptacle to have a ground conductor connected to a grounding screw. Where electrical terminations are located inside headwall, install grounding bus for each type of power, to ensure grounding of complete power system.
  - 2.6.3.4 Low Voltage Data Provisions: connected to device junction box via conduit or raceway. Provide pull cord extending from junction box to service provision. Refer to Division 26 for additional wiring requirements.
  - 2.6.3.5 Switching:
    - .1 HUBBEL industrial grade 120 or 277 volt, 15 or 20 amps. SPST, 3 way or momentary type as indicated on reviewed Shop Drawings.
    - .2 Low-voltage switching: 0-12 volts, 15 amps unless otherwise indicated.
    - .3 All switches to be provided pre-installed and pre-wired by manufacturer.
  - 2.6.3.6 Electrical Receptacles: All receptacles to be Hubbel Hospital Grade 15 or 20 amp, 120 or 277 volt, U.L listed and marked "Hospital Grade". Quantity and type as shown on reviewed Shop Drawings. Ensure

compatibility of plug on accessory equipment to be used with these devices.

- .1 Duplex and Simplex receptacles: NEMA style 5-15R or 5-20R.
- .2 Safety Receptacles: duplex type, NEMA style 5-15R or 5-20R. Ensure receptacles limited proper access to energized contacts and accept both 2 wire and 3 wire plugs.
- .3 Locking Receptacles: HUBBELL lock 23000 HG style, duplex type, 20 amp, 120 or 277 volt, color black
- .4 Colours: Ivory for use on normal (standard) circuits and red for use on emergency (critical) circuits, unless otherwise indicated. Provide grey for UPS circuits.

**2.6.4 Provisions:**

- 2.6.4.1 Provide accessories indicated on Drawings by manufacturer to ensure compatibility.
- 2.6.4.2 Ensure patient bed service walls can accommodate provisions including, but not limited to, nurse call equipment, monitoring equipment, data jacks, phone jacks, lighting, etc.
- 2.6.4.3 Provide factory-installed required EMT or flexible metal conduit runs to appropriate termination point at junction box.
- 2.6.4.4 Provide cover plates and trim plates for all provisions unless indicated otherwise.

**2.7 ACCESSORIES**

- 2.7.1 Provide accessories indicated on reviewed Shop Drawings. Accessories shall be selected at a later date in consultation with Authority and may include, but are not limited to: LED lighting, LCD mounts, wash stations etc.

**2.8 FINISHES**

- 2.8.1 Steel: Hot-dip galvanized after fabrication, ASTM A123 or ASTM A653
- 2.8.2 Aluminum: Class I, clear anodic finish; complying with AAMA 611

**PART 3 EXECUTION**

**3.1 MANUFACTURER'S INSTRUCTIONS**

- 3.1.1 Comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

**3.2 EXAMINATION**

- 3.2.1 Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation.



- 3.2.2 Inspect and verify that walls and areas in which work is to be performed are acceptable for headwall installation in accordance with manufacturer's published recommendations and all applicable Sections.
- 3.2.3 Proceed with installation only after discrepancies and unacceptable conditions have been remedied.

### **3.3 PREPARATION**

- 3.3.1 Coordinate headwall installation with work of other trades for proper sequence to avoid delays. Coordinate service connection work with electrical, piping, and communication Subcontractors.

### **3.4 INSTALLATION**

- 3.4.1 Install headwall units in accordance with manufacturer's instructions and in accordance with NFPA 70, NFPA 99 and local authorities having jurisdiction requirements. Install and make connections as required for a complete and operational patient bed service wall system for each unit.
- 3.4.2 Coordinate the work of this Section with other trades adjacent to work of this Section in particular Section 06 41 00 and Section 09 21 16.
- 3.4.3 Anchor all fixed components securely, square, level, and plumb at heights indicated on drawings.
- 3.4.4 Align slots in vertical support elements to ensure hanging units are level.

### **3.5 INSPECTION AND TESTING**

- 3.5.1 Inspect installation for proper installation in accordance with the CSA C22.1, and local electric safety code.
- 3.5.2 Submit 2 written reports on the results of the ground leakage testing and the installation inspection authored by equipment manufacturer's technician.
- 3.5.3 Arrange and pay for CSA or inspection, testing and approvals required by Authorities Having Jurisdiction for site wired headwall unit and associated systems electrical work.
- 3.5.4 Medical Gas System Testing:
  - 3.5.4.1 Medical gas system testing and submission of an associated report by an independent inspection consultant.
  - 3.5.4.2 Arrange for testing and submit written test results and certification of medical gas piping systems and outlets in accordance with CAN/CSA-Z305.1.

### **3.6 FIELD QUALITY CONTROL**

- 3.6.1 Manufacturer's Services: 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. Report any inconsistencies from manufacturer's recommendations immediately to Consultant.

- 3.6.2 Obtain field reports within three days of review and submit immediately to Consultant.

### **3.7 DEMONSTRATION**

- 3.7.1 Arrange and Provide a demonstration of the systems in a series of tests for the Consultant's verification.

### **3.8 CLEANING**

- 3.8.1 Clean all surfaces to remove all marks, soil, and foreign matter immediately after installation and adjustment are complete.
- 3.8.2 Recheck all components and perform any necessary additional cleaning just prior to substantial completion.
- 3.8.3 Remove surplus materials, debris, tools, and equipment upon completion.
- 3.8.4 Adjust headwall and service column components for easy, non-binding operation.
- 3.8.5 Remove and dispose of protective finishes and clean exposed surfaces.

### **3.9 PROTECTION**

- 3.9.1 Protect installed headwall from damage during remaining construction work.

**END OF SECTION**

## **PART 1      GENERAL**

### **1.1      GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.
- 1.1.2 Contractor is solely responsible for dividing the Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of the Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2      SUMMARY**

- 1.2.1 Provide labour, materials, Products, equipment and services to complete the Corner Guards work specified herein. This includes, but is not necessarily limited, to:
  - 1.2.1.1 Surface-mounted stainless steel corner guards.
  - 1.2.1.2 Auxiliary materials required for a complete installation.
- 1.2.2 Related Requirements: Specifications throughout all Divisions of the Project shall be read as a whole, and may be directly applicable to this Section. Related requirements provided below are for convenience purposes only:
  - 1.2.2.1 Section 05 50 00 - Metal Fabrications: for heavy-duty steel corner guards in back-of-house spaces.
  - 1.2.2.2 Section - Gypsum Board Assemblies.

### **1.3      REFERENCES**

- 1.3.1 Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply.

### **1.4      ADMINISTRATIVE REQUIREMENTS**

- 1.4.1 Pre-installation Meetings: Schedule and hold a pre-installation meeting at the Project site before beginning work on this Section to coordinate activities with related Subcontractors.
  - 1.4.1.1 Notification: Where Consultant attendance is required; minimum 72 hour notice is required.
  - 1.4.1.2 Reporting: Record significant discussions, agreements, and disagreements, including required corrective measures and actions.
  - 1.4.1.3 Distribution: Distribute minutes of the meeting to each party present and to other parties requiring information not more than 72 hours after meeting.

## **1.5 SUBMITTALS**

- 1.5.1 Submittals, generally: in accordance with Section 01 33 00, Submittal Procedures.
- 1.5.2 Product Data: Submit manufacturer's product characteristics, catalogue cuts, installation instructions and other relevant information for each type of corner guard used for Corner Guards work specified in this Section.
- 1.5.3 Shop Drawings: Submit Shop Drawings indicating material layouts, details of construction, connections, and relationship with adjacent construction. As a minimum indicate following:
  - 1.5.3.1 Show locations, dimensions, and attachment details for each type of corner guard.
- 1.5.4 Environmental and Material Transparency:
  - 1.5.4.1 Embodied Carbon / EPDs: When available, Submit EPDs conforming to ISO 14025 or equivalent standard; prioritize products with such documentation when choices are at Contractor's option.
  - 1.5.4.2 Material Ingredient Disclosure: When available, submit documentation identifying chemical inventories of materials to at least 0.1% (1000ppm) in accordance with HPD Open Standard, Cradle to Cradle (Basic v2/Bronze v3), ILFI Declare, or equivalent standard; products with such documentation when choices are at Contractor's option.
- 1.5.5 Samples: Submit selection and verification samples for Corner Guards work requiring colour, texture, or design selection.
  - 1.5.5.1 As a minimum submit samples for each type, colour, and texture of corner guard.

## **1.6 CLOSEOUT SUBMITTALS**

- 1.6.1 Operating and Maintenance Data: Submit cleaning and maintenance instructions for Corner Guards to be included in building operation and maintenance manual.
- 1.6.2 Warranty Documentation: Submit copy of extended warranties specified in this Section.

## **1.7 QUALITY ASSURANCE**

- 1.7.1 Manufacturer Qualifications: Provide Products for work of this Section by manufacturer with at least 10 years' experience manufacturing such materials.
- 1.7.2 Installer Qualifications: Engage an entity with at least 5 years' experience installing work similar in material, design, and extent to that shown on Drawings and Schedules, and whose work has resulted in construction with a track record of successful in-service performance. Installer to be approved by the manufacturer.
- 1.7.3 Single Source Responsibility: Obtain primary materials for this Section from a single source by a single manufacturer.
- 1.7.4 First Installation Review: Construct sample installations to demonstrate quality of workmanship, verify selections made under submittals, and to set quality standards for fabrication and installation.

- 1.7.4.1 Location: In-situ (i.e. first installation), as directed on site by Consultant.
- 1.7.4.2 Purpose: To set benchmarks for installation and to judge subsequent work. Maintain such sample installations during construction in undisturbed condition.
- 1.7.4.3 Reviewed Sample Installations: May become part of the completed work if undisturbed at the time of Substantial Performance of The work, provided they comply with requirements outlined in Contract Documents.

## **1.8 DELIVERY, STORAGE AND HANDLING**

- 1.8.1 Product Requirements, generally: in accordance with Section 01 61 00, Common Product Requirements.
- 1.8.2 Deliver, store and handle Corner Guards materials in accordance with manufacturer's written instructions. Deliver materials to site in original factory packaging, labelled with manufacturer's name and address. Store materials off-ground, in a clean, dry, well-ventilated area, protected from weather. Replace defective or damaged materials with new.
- 1.8.3 Store corner guards vertically.

## **1.9 FIELD CONDITIONS**

- 1.9.1 Environmental Restrictions: Do not deliver or install Corner Guards until building is enclosed, wet work is complete, and HVAC system is operational and will maintain stable temperature and relative humidity levels equal to occupancy levels for remainder of construction period.
- 1.9.2 Acclimatize plastic materials at a minimum temperature of 21°C (70°F) for at least 72 hours prior to installation.

## **1.10 WARRANTY**

- 1.10.1 Extended warranty: Submit for Owner's review and acceptance, manufacturer's extended warranty in which manufacturer commits to repair or replace components of Corner Guards that fail within specified warranty period. Manufacturer's extended warranty is in addition to, and does not supersede, any other rights that Owner may have under Contract Documents.
  - 1.10.1.1 Warranty Period: Not less than 5 years from date of Substantial Performance of The work.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURERS**

- 2.1.1 Provided requirements of Contract Documents are satisfied, the following manufacturers may supply Products for work this Section:
  - 2.1.1.1 Construction Specialties (C/S)
  - 2.1.1.2 InPro Corporation
  - 2.1.1.3 Pawling Corporation

## **2.2 PERFORMANCE / DESIGN CRITERIA**

- 2.2.1 Surface-Burning Characteristics for Plastic Covers: In accordance with CAN/ULC-S102.2
  - 2.2.1.1 Flame Spread: 150 or less.
  - 2.2.1.2 Smoke Development: 300 or less.
- 2.2.2 Chemical and Stain Resistance: Provide materials that show no significant degradation, discolouration, or staining when tested in accordance with ASTM D543 or ASTM D1308 against common healthcare cleaning agents and substances, including but not limited to:
  - 2.2.2.1 Diluted bleach solutions (10:1), quaternary ammonium disinfectants, isopropyl alcohol, hydrogen peroxide, iodine, and betadine.
- 2.2.3 Impact Resistance: Provide materials capable of withstanding high impact forces typical in high-traffic healthcare environments from gurneys, carts, and equipment without cracking, denting, or chipping that would compromise the surface integrity.
- 2.2.4 Cleanability and Porosity: Provide materials with non-porous surfaces that are smooth and easily cleaned, do not support microbial growth, and can withstand repeated cleaning cycles without degradation.

## **2.3 MATERIALS**

- 2.3.1 Aluminum Extrusions (Retainers): ASTM B221M, Alloy 6063-T5.
- 2.3.2 Stainless Steel: ASTM A240/A240M, Type 304.
- 2.3.3 Fasteners: Concealed, noncorrosive metal fasteners suitable for substrate.

## **2.4 STAINLESS STEEL CORNER GUARDS**

- 2.4.1 Material Tag: This item is noted as "CG-#" on Drawings and Schedules
- 2.4.2 Description: Formed Type 304 stainless steel corner guard with following characteristics:
  - 2.4.2.1 Thickness: Minimum 1.6 mm (16 ga.).
  - 2.4.2.2 Wing Size: Refer to Section 09 06 00 - Schedule of Finishes.
  - 2.4.2.3 Height: As indicated on Drawings.
  - 2.4.2.4 Finish: Refer to Section 09 06 00 - Schedule of Finishes.
  - 2.4.2.5 Mounting: Adhesive.
- 2.4.3 Basis-of-Design: Refer to Section 09 06 00 - Schedule of Finishes

## **2.5 ACCESSORIES**

- 2.5.1 Fasteners: Concealed aluminum, nonmagnetic stainless-steel, or other noncorrosive metal screws, bolts, and other fasteners compatible with items being fastened. Exposed fasteners are not permitted.
- 2.5.2 Adhesives and Sealants: As recommended by sheet manufacturer for substrate conditions. Provide products that are low-emitting and compliant with SCAQMD Rule 1168 and CDPH Standard Method v1.2.

## **2.6 FABRICATION**

- 2.6.1 Fabricate corner guards to comply with requirements indicated for design, dimensions, and member sizes, including thicknesses of components.
- 2.6.2 Fit and assemble work of this Section in shop where possible. Execute according to details and reviewed Shop Drawings. Where shop fabrication is not possible, execute trial assembly in shop.
- 2.6.3 Fabricate finished work free from distortion, weld splatter and defects detrimental to appearance and performance.
- 2.6.4 Do not expose trademarks or labels on finished surfaces.
- 2.6.5 Fabricate components with tight seams and joints with exposed edges rolled. Provide surfaces free of wrinkles, chips, dents, uneven coloration, and other imperfections. Fabricate members and fittings to produce flush, smooth, and rigid hairline joints.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- 3.1.1 Verify actual site conditions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation, such as substrates that are not plumb, true, or ready to receive work.
- 3.1.2 Verify that backing and blocking are installed correctly as per Shop Drawings.
- 3.1.3 Verify gypsum board substrate smooth, plumb and true, free of waves bulges and within tolerances specified in Section 09 21 16.
- 3.1.4 Commencement of work implies acceptance of previously completed work.

### **3.2 INSTALLATION**

- 3.2.1 Installation, generally: Install work of this Section in strict accordance with manufacturer's written installation instructions and reviewed Shop Drawings.
- 3.2.2 Install units plumb, true to line, and without distortion. Install corner guards in locations and at mounting heights indicated on Drawings and Schedules.

### **3.3 PROTECTION**

- 3.3.1 Protect Corner Guards from damage, soiling and contaminating substances resulting from construction activities or caused by work of other trades.
- 3.3.2 Where soiling or spills have occurred, remove spills and soiling from adjacent surfaces using cleaning procedures recommended in writing by affected material's manufacturer. Do not use materials or process that can damage finishes, surfaces, or construction.
- 3.3.3 Promptly replace Corner Guards work damaged during construction that cannot be satisfactorily repaired.

### **3.4 CLEANING AND WASTE MANAGEMENT**

- 3.4.1 Cleaning: Upon completion of installation, clean surfaces in accordance with manufacturer's recommendations. Maintain clean construction area at the end of each day. When activities of this Section are complete, remove materials, tools, equipment and rubbish.
- 3.4.2 Waste Management and Disposal: Sort waste for reuse, recycling, or disposal, as specified. Remove recycling bins and containers from site and dispose of contents at the appropriate waste disposal facilities.

END OF SECTION



## **PART 1      GENERAL**

### **1.1      GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.
- 1.1.2 Contractor is solely responsible for dividing the Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of the Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2      SUMMARY**

- 1.2.1 Provide labour, materials, Products, equipment and services to complete the sheet wall protection work specified herein. This includes, but is not necessarily limited, to:
  - 1.2.1.1 Impact-Resistant Plastic Sheet Wall Covering (PETG).
  - 1.2.1.2 Stainless Steel Wall Protection.
  - 1.2.1.3 Trims, accessories, and adhesives for a complete installation
- 1.2.2 Related Requirements: Specifications throughout all Divisions of the Project shall be read as a whole, and may be directly applicable to this Section. Related requirements provided below are for convenience purposes only:
  - 1.2.2.1 Section 09 21 16 - Gypsum Board Assemblies.

### **1.3      REFERENCES**

- 1.3.1 Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply.

### **1.4      ADMINISTRATIVE REQUIREMENTS**

- 1.4.1 Pre-installation Meetings: Schedule and hold a pre-installation meeting at the Project site before beginning work on this Section to coordinate activities with related Subcontractors.
  - 1.4.1.1 Notification: Where Consultant attendance is required; minimum 72 hour notice is required.
  - 1.4.1.2 Reporting: Record significant discussions, agreements, and disagreements, including required corrective measures and actions.
  - 1.4.1.3 Distribution: Distribute minutes of the meeting to each party present and to other parties requiring information not more than 72 hours after meeting.

## **1.5 SUBMITTALS**

- 1.5.1 Submittals, generally: in accordance with Section 01 33 00, Submittal Procedures.
- 1.5.2 Product Data: Submit manufacturer's product characteristics, catalogue cuts, installation instructions and other relevant information for each type of sheet wall protection used for Sheet wall protections work specified in this Section.
- 1.5.3 Shop Drawings: Submit Shop Drawings indicating material layouts, details of construction, connections, and relationship with adjacent construction. As a minimum indicate following:
  - 1.5.3.1 Show locations, dimensions, and attachment details for each type of sheet wall protection.
  - 1.5.3.2 Show panel layouts, joint locations, and details at penetrations and corners.
- 1.5.4 Environmental and Material Transparency:
  - 1.5.4.1 Embodied Carbon / EPDs: When available, Submit EPDs conforming to ISO 14025 or equivalent standard; prioritize products with such documentation when choices are at Contractor's option.
  - 1.5.4.2 Material Ingredient Disclosure: When available, submit documentation identifying chemical inventories of materials to at least 0.1% (1000ppm) in accordance with HPD Open Standard, Cradle to Cradle (Basic v2/Bronze v3), ILFI Declare, or equivalent standard; products with such documentation when choices are at Contractor's option.
- 1.5.5 Samples: Submit selection and verification samples for Sheet wall protections work requiring colour, texture, or design selection.
  - 1.5.5.1 As a minimum submit samples for each type, colour, and texture of sheet wall protection.

## **1.6 CLOSEOUT SUBMITTALS**

- 1.6.1 Operating and Maintenance Data: Submit cleaning and maintenance instructions for Sheet wall protections to be included in building operation and maintenance manual.
- 1.6.2 Warranty Documentation: Submit copy of extended warranties specified in this Section.

## **1.7 QUALITY ASSURANCE**

- 1.7.1 Manufacturer Qualifications: Provide Products for work of this Section by manufacturer with at least 10 years' experience manufacturing such materials.
- 1.7.2 Installer Qualifications: Engage an entity with at least 5 years' experience installing work similar in material, design, and extent to that shown on Drawings and Schedules, and whose work has resulted in construction with a track record of successful in-service performance. Installer to be approved by the manufacturer.
- 1.7.3 Single Source Responsibility: Obtain primary materials for this Section from a single source by a single manufacturer.

1.7.4 First Installation Review: Construct sample installations to demonstrate quality of workmanship, verify selections made under submittals, and to set quality standards for fabrication and installation.

1.7.4.1 Location: In-situ (i.e. first installation), as directed on site by Consultant.

1.7.4.2 Purpose: To set benchmarks for installation and to judge subsequent work. Maintain such sample installations during construction in undisturbed condition.

1.7.4.3 Reviewed Sample Installations: May become part of the completed work if undisturbed at the time of Substantial Performance of The work, provided they comply with requirements outlined in Contract Documents.

## **1.8 DELIVERY, STORAGE AND HANDLING**

1.8.1 Product Requirements, generally: in accordance with Section 01 61 00, Common Product Requirements.

1.8.2 Deliver, store and handle Sheet wall protections materials in accordance with manufacturer's written instructions. Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

1.8.3 Store sheets flat, in a clean, dry, well-ventilated area, protected from weather and direct sunlight. Replace defective or damaged materials with new.

## **1.9 FIELD CONDITIONS**

1.9.1 Environmental Restrictions: Do not deliver or install Sheet wall protections until building is enclosed, wet work is complete, and HVAC system is operational and will maintain stable temperature and relative humidity levels equal to occupancy levels for remainder of construction period.

1.9.2 Acclimatize plastic materials at a minimum temperature of 21°C (70°F) for at least 72 hours prior to installation.

## **1.10 WARRANTY**

1.10.1 Extended warranty: Submit for Owner's review and acceptance, manufacturer's extended warranty in which manufacturer commits to repair or replace components of Sheet wall protections that fail within specified warranty period. Manufacturer's extended warranty is in addition to, and does not supersede, any other rights that Owner may have under Contract Documents.

1.10.1.1 Warranty Period: Not less than 5 years from date of Substantial Performance of The work.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURERS**

2.1.1 Provided requirements of Contract Documents are satisfied, the following manufacturers may supply Products for work this Section:

2.1.1.1 As specified in this Section.

## **2.2 PERFORMANCE / DESIGN CRITERIA**

- 2.2.1 Surface-Burning Characteristics for sheet wall protection: In accordance with CAN/ULC-S102.2
  - 2.2.1.1 Flame Spread: 25 or less.
  - 2.2.1.2 Smoke Development: 150 or less; except smoke developed to be 50 or less in corridors.
- 2.2.2 Chemical and Stain Resistance: Provide materials that show no significant degradation, discolouration, or staining when tested in accordance with ASTM D543 or ASTM D1308 against common cleaning agents and substances, including but not limited to:
  - 2.2.2.1 Diluted bleach solutions (10:1), quaternary ammonium disinfectants, isopropyl alcohol, hydrogen peroxide, iodine, and betadine.
- 2.2.3 Impact Resistance: Provide materials tested to ASTM D256 capable of withstanding high impact forces typical in high-traffic environments from gurneys, carts, and equipment without cracking, denting, or chipping that would compromise the surface integrity.
- 2.2.4 Cleanability and Porosity: Provide materials with non-porous surfaces that are smooth and easily cleaned, do not support microbial growth, and can withstand repeated cleaning cycles without degradation.
- 2.2.5 Fungal and Bacterial Resistance: Provide materials that do not support fungal or bacterial growth as tested in accordance with ASTM G21 and ASTM G22.

## **2.3 IMPACT-RESISTANT PVC-FREE SHEET WALL COVERING**

- 2.3.1 Material Tag: This item is noted as "SWC-#" on Drawings and Schedules.
- 2.3.2 Description: High impact, semi-rigid, PVC-free PETG plastic sheet suitable for public corridors, patient rooms, and other high-traffic areas.
- 2.3.3 Sheet Size: Maximum size available to minimize seams.
- 2.3.4 Thickness: Refer to Section 09 06 00 - Schedule of Finishes.
- 2.3.5 Trim and Joints: Extruded rigid plastic trim matching sheet colour.
- 2.3.6 Colour and Texture: Refer to Section 09 06 00 - Schedule of Finishes.
- 2.3.7 Height: Refer to Section 09 06 00 - Schedule of Finishes.
- 2.3.8 Basis-of-Design: Refer to Section 09 06 00 - Schedule of Finishes.

## **2.4 ACCESSORIES**

- 2.4.1 Fasteners: Concealed aluminum, nonmagnetic stainless-steel, or other noncorrosive metal screws, bolts, and other fasteners compatible with items being fastened. Exposed fasteners are not permitted.
- 2.4.2 Adhesives and Sealants: As recommended by sheet manufacturer for substrate conditions. Provide products that are low-emitting and compliant with SCAQMD Rule 1168 and CDPH Standard Method v1.2.

## **2.5 FABRICATION**

- 2.5.1 Fabricate sheet wall protection to comply with requirements indicated for design, dimensions, and member sizes, including thicknesses of components.
- 2.5.2 Fit and assemble work of this Section in shop where possible. Execute according to details and reviewed Shop Drawings. Where shop fabrication is not possible, execute trial assembly in shop.
- 2.5.3 Fabricate finished work free from distortion, weld splatter and defects detrimental to appearance and performance.
- 2.5.4 Do not expose trademarks or labels on finished surfaces.
- 2.5.5 Fabricate components with tight seams and joints with exposed edges rolled. Provide surfaces free of wrinkles, chips, dents, uneven coloration, and other imperfections. Fabricate members and fittings to produce flush, smooth, and rigid hairline joints.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- 3.1.1 Verify actual site conditions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation, such as substrates that are not plumb, true, or ready to receive work.
- 3.1.2 Verify that backing and blocking are installed correctly as per Shop Drawings.
- 3.1.3 Verify gypsum board substrate smooth, plumb and true, free of waves bulges and within tolerances specified in Section 09 21 16.
- 3.1.4 Commencement of work implies acceptance of previously completed work.

### **3.2 INSTALLATION**

- 3.2.1 Installation, generally: Install work of this Section in strict accordance with manufacturer's written installation instructions and reviewed Shop Drawings.
- 3.2.2 Install units plumb, true to line, and without distortion. Install sheet wall protection in locations and at mounting heights indicated on Drawings and Schedules.
- 3.2.3 Do not place vertical joints within 150 mm (6 inches) of any inside or outside corner.
- 3.2.4 Ensure material is fully adhered at inside corners without coving.
- 3.2.5 Remove and replace materials showing blisters, imperfect seams, or other defects.

### **3.3 PROTECTION**

- 3.3.1 Protect Sheet wall protections from damage, soiling and contaminating substances resulting from construction activities or caused by work of other trades.
- 3.3.2 Where soiling or spills have occurred, remove spills and soiling from adjacent surfaces using cleaning procedures recommended in writing by affected

material's manufacturer. Do not use materials or process that can damage finishes, surfaces, or construction.

- 3.3.3 Promptly replace Sheet wall protections work damaged during construction that cannot be satisfactorily repaired.

### **3.4 CLEANING AND WASTE MANAGEMENT**

- 3.4.1 Cleaning: Upon completion of installation, clean surfaces in accordance with manufacturer's recommendations. Maintain clean construction area at the end of each day. When activities of this Section are complete, remove materials, tools, equipment and rubbish.
- 3.4.2 Waste Management and Disposal: Sort waste for reuse, recycling, or disposal, as specified. Remove recycling bins and containers from site and dispose of contents at the appropriate waste disposal facilities.

END OF SECTION

## **PART 1      GENERAL**

### **1.1      GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.
- 1.1.2 Contractor is solely responsible for dividing the Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of the Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2      SUMMARY**

- 1.2.1 Provide labour, materials, Products, equipment and services to complete the washroom accessories work specified herein. This includes, but is not necessarily limited, to:
  - 1.2.1.1 Commercial Washroom Accessories
  - 1.2.1.2 Auxiliary materials required for a complete installation.
- 1.2.2 Related Requirements: Specifications throughout all Divisions of the Project shall be read as a whole, and may be directly applicable to this Section.

### **1.3      REFERENCES**

- 1.3.1 Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply.

### **1.4      SUBMITTALS**

- 1.4.1 Product Data: Submit manufacturer's product characteristics, catalogue cuts, installation instructions and other relevant information for each material and product used for washroom accessories work specified in this Section.
- 1.4.2 Schedule: Submit washroom accessory schedule, indicating the type and quantity to be installed in each washroom. Use room numbers as indicated on the Drawings.

### **1.5      CLOSEOUT SUBMITTALS**

- 1.5.1 Operating and Maintenance Data: Submit care and maintenance instructions for washroom accessories to be included in building operation and maintenance manual.

### **1.6      QUALITY ASSURANCE**

- 1.6.1 Manufacturer Qualifications: Provide Products for work of this Section by manufacturer with at least 10 years' experience manufacturing such materials.

- 1.6.2 Single Source Responsibility: Provide products of same manufacturer for each type of accessory unit and for units exposed to view in same areas, unless otherwise acceptable to Consultant. Key units alike unless indicated otherwise.

## **1.7 DELIVERY, STORAGE, AND HANDLING**

- 1.7.1 Deliver, store and handle materials and products in strict compliance with manufacturer's instructions and recommendations. Protect from damage.
- 1.7.2 Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- 1.7.3 Store materials in off-ground, in clean, dry, well-ventilated area.
- 1.7.4 Replace defective or damaged materials with new.

## **1.8 WARRANTY**

- 1.8.1 Extended warranty: Submit for Owner's review and acceptance, manufacturer's extended warranty in which manufacturer commits to repair or replace components of washroom accessories that fail within specified warranty period. Manufacturer's extended warranty is in addition to, and does not supersede, any other rights that Owner may have under Contract Documents.
  - 1.8.1.1 Warranty Period for Mirrors: 10 years from date of Substantial Performance of The work.
  - 1.8.1.2 Warranty Period for Hand Dryers: 5 years from date of Substantial Performance of The work.
  - 1.8.1.3 Other accessories: Manufacturer's standard.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURERS**

- 2.1.1 Provided requirements of Contract Documents are satisfied, the following manufacturers may supply Products for work this Section:
  - 2.1.1.1 ASI Group Canada;
  - 2.1.1.2 Bobrick Washroom Equipment of Canada Ltd.;
  - 2.1.1.3 Frost Products Limited;

### **2.2 REGULATORY REQUIREMENTS**

- 2.2.1 Accessibility Requirements: Comply with requirements applicable in the jurisdiction of the project, including but not limited to CSA B651 and OBC requirements as applicable.

### **2.3 DESIGN/PERFORMANCE REQUIREMENTS**

- 2.3.1 Stainless Steel Quality: Use high-quality stainless steel (Type 304 or Type 302) for washroom accessories. Provide ANSI No. 4 mechanical brushed finish unless indicated otherwise. Ensure vertical grain direction for visual consistency and ease of cleaning. Maintain consistency in components. Provide material thicknesses as specified.



- 2.3.2 Reinforcing Material: Use commercial quality cold rolled galvanized sheet steel (ASTM A653/A653M) with zinc coating designation Z275 (G90). Minimum thickness: 0.912 mm (20 gauge).
- 2.3.3 Provide specified washroom accessories with indicated options. Verify model numbers before installation.
- 2.3.4 Accommodation for Semi-recessed Mounting: Provide stainless steel collars for semi-recessed mounting when unit depth exceeds wall cavity depth. Ensure flush appearance in the finished Work.
- 2.3.5 Anti-Tampering Measures: Provide unobtrusive anti-tampering design features to prevent theft or damage.
- 2.3.6 Compliance with Accessibility Guidelines: Install accessories at heights and locations that comply with barrier-free codes and guidelines including, but not limited to the OBC and CSA B651.
- 2.3.7 Durability and Lifespan: Provide accessories designed for high-usage environments. Ensure accessories are resistant to cleaning chemicals.
- 2.3.8 Ease of Maintenance: Design accessories for easy maintenance. Accessories must simplify supply of replenishment and replacement or repair processes for parts.

## **2.4 GRAB BARS (GRB-#)**

- 2.4.1 Manufacturer's standard grab bar with following characteristics:
  - 2.4.1.1 Material: Type-304 stainless steel
  - 2.4.1.2 Finish: Satin
  - 2.4.1.3 Surface: Slip-resistant
  - 2.4.1.4 Wall Thickness: 1.2mm (18-gauge)
  - 2.4.1.5 Outside Diameter: 32mm (1-1/4") unless indicated otherwise.
  - 2.4.1.6 Clearance from wall: 38mm (1-1/2")
  - 2.4.1.7 Mounting Flanges: Concealed, stainless steel plate with 3.2mm (11-gauge) flange covers.
- 2.4.2 Straight Grab Bar (GRB-1):
  - 2.4.2.1** Length: Refer to Section 09 06 00 – Schedule of Finishes.
  - 2.4.2.2 Acceptable Products: Refer to Section 09 06 00 – Schedule of Finishes.
- 2.4.3 L-Shaped Grab Bar, 90 deg Grab Bar (GRB-2):
  - 2.4.3.1 Size: Refer to Section 09 06 00 – Schedule of Finishes. .
  - 2.4.3.2 Acceptable Products: Refer to Section 09 06 00 – Schedule of Finishes.
- 2.4.4 Swing up Grab Bar (GRB-3):
  - 2.4.4.1 Outside diameter: 32 mm (1-1/4 in)
  - 2.4.4.2 Size: 762 mm (30 in)
  - 2.4.4.3 Acceptable Products: Refer to Section 09 06 00 – Schedule of Finishes.

## **2.5 MIRRORS (MIR-1)**

- 2.5.1 One-piece mirror with satin-finished Type 304 stainless steel frame with polished corners, beveled mirror edge, galvanized steel back, theft-resistant mounting, and concealed wall hanger.
  - 2.5.1.1 Hanging Brackets: Integral horizontal hanging brackets located at top and bottom.
  - 2.5.1.2 Glass: Minimum 6 mm (1/ in) No.1 quality float glass
  - 2.5.1.3 Mounting: Concealed wall hanger to prevent mirror from pulling away from wall.
  - 2.5.1.4 Mirror Size: Refer to Section 09 06 00 - Schedule of Finishes.
  - 2.5.1.5 Acceptable Products: Refer to Section 09 06 00 - Schedule of Finishes.

## **2.6 SANITARY NAPKIN DISPOSAL (SND-1):**

- 2.6.1 0.8 mm thick (22 gauge) type-304 stainless steel sanitary napkin disposal with all-welded construction, satin finish, and integral finger depression for opening cover.
  - 2.6.1.1 Surface-Mounted Type: Refer to Section 09 06 00 - Schedule of Finishes.

## **2.7 PAPER TOWEL DISPENSER (PTTD-1)**

- 2.7.1 Surface Paper Towel Dispenser: Paper towel dispenser stainless steel paper towel dispenser with satin finish, capable of dispensing C-fold or multifold paper towels with following characteristics:
  - 2.7.1.1 Cabinet: All-welded, 18-8, Type 304, 0.8mm (22 gauge) stainless steel with satin finish on exposed surfaces.
  - 2.7.1.2 Door: All-welded, 18-8, Type 304, 1.2mm (18 gauge) stainless steel with satin finish on exposed surfaces.
  - 2.7.1.3 Locking: Tumbler lock keyed like other washroom accessories.
  - 2.7.1.4 Acceptable Products: Refer to Section 09 06 00 - Schedule of Finishes.

## **2.8 TOILET TISSUE DISPENSERS (TPH-1)**

- 2.8.1 Surface-Mounted, Twin Jumbo-Roll, Type:
  - 2.8.1.1 Stainless steel jumbo-roll toilet tissue dispenser with high-impact ABS dispensing mechanism, capable of accommodating two toilet tissue rolls up to 133 mm (5-1/4 inches) in diameter.
  - 2.8.1.2 Acceptable Products: Refer to Section 09 06 00 - Schedule of Finishes.

## **2.9 SOAP DISPENSER (SD-1):**

- 2.9.1 Material: 0.8 mm thick (22 gauge) Type AISI 304 stainless steel, satin finish container with locked, hinged stainless steel lid for top filling.
  - 2.9.1.1 Capacity: 1200 ml.

2.9.2 Soap Level Indicator: Equipped with clear acrylic refill-indicator window to monitor the amount of soap available in the dispenser.

2.9.3 Acceptable Products: Refer to Section 09 06 00 - Schedule of Finishes.

## **2.10 COAT HOOK (CH-1)**

2.10.1.1 Single Robe Hook: Type-304 stainless steel satin finish with minimum 22 gauge (0.8mm), flange, concealed mounting bracket secured to wall plate with stainless steel setscrew and caps.

2.10.1.2 Extension: 51 mm (2")

2.10.1.3 Acceptable Products: Refer to Section 09 06 00 – Schedule of Finishes.

## **2.11 STAINLESS-STEEL SHELF (SLF-1)**

2.11.1 Description: wall-mounted stainless steel shelf with 22-gauge thickness in no. 4 brushed finish welded to stainless steel wall plate and rounded corner shelf with safety edges on all protruding sides.

2.11.1.1 Shelf Depth: 99mm (3.9")

2.11.1.2 Shelf size: 457mm (18")

2.11.2 Acceptable Products: Refer to Section 09 06 00 – Schedule of Finishes.

## **2.12 FABRICATION**

2.12.1 Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

2.12.2 Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner.

# **PART 3 EXECUTION**

## **3.1 EXAMINATION**

3.1.1 Prior to commencing work, verify actual site conditions and location of adjacent materials. Notify appropriate parties in writing of conditions that may compromise proper installation of materials.

3.1.2 Do not begin activities of this Section until unacceptable conditions have been resolved.

## **3.2 INSTALLATION**

3.2.1 Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated on Drawings and Schedules and recommended by unit manufacturer, including the following:

3.2.1.1 Verify blocking has been installed properly.

3.2.1.2 Verify location does not interfere with door swings or use of fixtures.

- 3.2.1.3 Comply with manufacturer's recommendations for backing and proper support.
- 3.2.1.4 Use fasteners and anchors suitable for substrate and project conditions.
- 3.2.1.5 Install units rigid, straight, plumb, and level, in accordance with manufacturer's installation instructions and approved shop drawings.
- 3.2.1.6 Conceal evidence of drilling, cutting, and fitting to room finish.
- 3.2.1.7 Test for proper operation.
- 3.2.2 Grab Bars: Install to withstand a downward load of at least 1.3 kN (293 lbf), when tested according to ASTM F 446.

### **3.3 CLEANING AND PROTECTION**

- 3.3.1 Clean exposed surfaces of compartments, hardware, and fittings using methods acceptable to the manufacturer.
- 3.3.2 Touch-up, repair or replace damaged products until Substantial Performance of the Work.

### **3.4 ADJUSTING AND CLEANING**

- 3.4.1 Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.
- 3.4.2 Remove temporary labels and protective coatings.
- 3.4.3 Clean and polish exposed surfaces according to manufacturer's written recommendations.

**END OF SECTION**

## **PART 1      GENERAL**

### **1.1      GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.
- 1.1.2 Contractor is solely responsible for dividing the Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of the Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2      SUMMARY**

- 1.2.1 Provide labour, materials, Products, equipment and services to complete the phenolic lockers work specified herein. This includes, but is not necessarily limited, to:
  - 1.2.1.1 Phenolic corridor lockers.
  - 1.2.1.2 Auxiliary materials required for a complete installation.
- 1.2.2 Related Requirements: Specifications throughout all Divisions of the Project shall be read as a whole, and may be directly applicable to this Section. Related requirements provided below are for convenience purposes only:
  - 1.2.2.1 Section 06 10 00, Rough Carpentry: wood blocking.
  - 1.2.2.2 Section 06 41 00, Architectural Wood Casework: provide of plastic laminate cubbies.
  - 1.2.2.3 Section 09 21 16, Gypsum Board Assemblies: provision of gypsum board and framing systems.

### **1.3      REFERENCES**

- 1.3.1 Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply.

### **1.4      ADMINISTRATIVE REQUIREMENTS**

- 1.4.1 Pre-installation Meetings: Schedule and hold a pre-installation meeting at the Project site before beginning work on this Section to coordinate activities with related Subcontractors.

### **1.5      SUBMITTALS**

- 1.5.1 Submittals, generally: in accordance with Section 01 33 00, Submittal Procedures.
- 1.5.2 Product Data: Submit manufacturer's product characteristics, catalogue cuts, installation instructions and other relevant information for each material and product used for phenolic lockers work specified in this Section.

- 1.5.2.1 Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of phenolic locker and bench.
- 1.5.3 Shop Drawings: Submit Shop Drawings indicating material layouts, details of construction, connections, and relationship with adjacent construction. As a minimum indicate following:
  - 1.5.3.1 Include plans, elevations, sections and details as applicable.
  - 1.5.3.2 Show locker trim and accessories.
  - 1.5.3.3 Include locker identification system and numbering sequence.
- 1.5.4 Environmental and Material Transparency:
  - 1.5.4.1 Embodied Carbon / EPDs: When available, Submit EPDs conforming to ISO 14025 or equivalent standard; prioritize products with such documentation when choices are at Contractor's option.
  - 1.5.4.2 Material Ingredient Disclosure: When available, submit documentation identifying chemical inventories of materials to at least 0.1% (1000ppm) in accordance with HPD Open Standard, Cradle to Cradle (Basic v2/Bronze v3), ILFI Declare, or equivalent standard; products with such documentation when choices are at Contractor's option.
- 1.5.5 Samples: Submit selection and verification samples for phenolic lockers work requiring colour, texture, or design selection. Submit manufacturer's list of finishes or colour swatches for Consultant's selection.
  - 1.5.5.1 As a minimum submit samples of the following:
    - .1 Submit manufacturer's colour charts showing the full range of colours available.

## **1.6 CLOSEOUT SUBMITTALS**

- 1.6.1 Operating and Maintenance Data: Submit care and maintenance instructions for phenolic lockers to be included in building operation and maintenance manual.
- 1.6.2 Warranty Documentation: Submit copy of extended warranties specified in this Section.

## **1.7 MAINTENANCE MATERIAL SUBMITTALS**

- 1.7.1 Extra Stock Materials: Deliver, for Owner's future maintenance use following phenolic locker hardware items equal to 10% of the amount installed for each type and finish, but no fewer than five units:
  - 1.7.1.1 Locks.
  - 1.7.1.2 Blank identification plates.
  - 1.7.1.3 Hooks.
- 1.7.2 Identify each package with pertinent information, including manufacturer's name, Product name, series and colour.
- 1.7.3 Unless indicated otherwise, maintenance materials submitted must be from same production run as installed materials.
- 1.7.4 Store materials in locations directed by Owner.

## **1.8 QUALITY ASSURANCE**

- 1.8.1 Manufacturer Qualifications: Provide Products for work of this Section by manufacturer with at least 10 years' experience manufacturing such materials.
- 1.8.2 Installer Qualifications: Engage an entity with sufficient experience installing, erecting, or assembling work similar in material, design, and extent to that shown on Drawings and Schedules, and whose work has resulted in construction with a track record of successful in-service performance.
- 1.8.3 Single Source Responsibility: Obtain primary materials for this Section from a single source by a single manufacturer, and secondary materials from sources recommended by manufacturers of primary materials.
  - 1.8.3.1 Obtain phenolic lockers, locker benches, and accessories from a single source from a single locker manufacturer.
  - 1.8.3.2 Obtain locks from a single lock manufacturer.
- 1.8.4 First Installation Review: Construct sample installations to verify selections made under submittals, demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
  - 1.8.4.1 Location: In-situ (i.e. first installation), as directed on site by Consultant.
  - 1.8.4.2 Purpose: To set benchmarks for installation and to judge subsequent work. Maintain such sample installations during construction in undisturbed condition.
  - 1.8.4.3 Reviewed Sample Installations: may become part of the completed work if undisturbed at the time of Substantial Performance of The work, provided they comply with requirements outlined in Contract Documents.

## **1.9 DELIVERY, STORAGE AND HANDLING**

- 1.9.1 Product Requirements, generally: in accordance with Section 01 61 00, Common Product Requirements.
- 1.9.2 Deliver, store and handle phenolic lockers materials in accordance with manufacturer's written instructions. deliver materials to site in original factory packaging, labelled with manufacturer's name and address. Store materials in off-ground, in clean, dry, well-ventilated area. Replace defective or damaged materials with new.

## **1.10 FIELD CONDITIONS**

- 1.10.1 Environmental Restrictions: Do not deliver phenolic lockers until spaces to receive them are clean, dry, and ready for installation. Start Work of this section only after building is enclosed with complete protection from the elements.
- 1.10.2 Field Measurements: Verify actual dimensions of recessed openings by field measurements before fabrication.

## **1.11 WARRANTY**

- 1.11.1 Extended warranty: Submit for Owner's review and acceptance, manufacturer's extended warranty in which manufacturer commits to repair or replace

components of phenolic lockers that fail within specified warranty period. Manufacturer's extended warranty is in addition to, and does not supersede, any other rights that Owner may have under Contract Documents.

1.11.1.1 Warranty Period: Not less than 10 years from date of Substantial Performance of The work.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURERS**

2.1.1 Provided requirements of Contract Documents are satisfied, the following manufacturers may supply Products for work this Section:

- 2.1.1.1 Bradley Corporation.
- 2.1.1.2 ASI Storage Solutions (ASI)
- 2.1.1.3 Spectrum Lockers

### **2.2 PERFORMANCE / DESIGN CRITERIA**

- 2.2.1 Functional Requirements: Provide lockers for secure and durable storage compartments for personal belongings, equipment, and materials.
- 2.2.2 Locker Construction: Fabricate lockers from solid phenolic panels, suitable for intended use, with minimum thickness as specified in this Section.
- 2.2.3 Phenolic panels must be inherently resistant to corrosion and rust.
- 2.2.4 Finish exposed edges to eliminate sharp edges.
- 2.2.5 Construction: Construct locker bodies as modular units. Use bolted connections or other methods to provide equivalent or superior structural integrity.
- 2.2.6 Door Latching: Equip doors with a latching mechanism to ensure secure closure. Each locker must include a secure locking mechanism, incorporating a hasp for a user-provided padlock or other locking mechanism as specified in Contract Documents.
- 2.2.7 Ventilation: Fabricate locker doors with ventilation slots or perforations to promote air circulation and minimize odor accumulation.
- 2.2.8 Barrier-Free Design: Comply with CAN/CSA B651 for location of shelves, hardware, and maximum operating forces.

### **2.3 STANDARD DUTY PHENOLIC LOCKERS**

- 2.3.1 Typical Locker Module Dimensions: Refer to Drawings.
- 2.3.2 Locker Components: Construct components from solid phenolic core decorative laminate consisting of multiple resin-impregnated kraft and surface sheets, fused at high temperature and pressure to ensure durability and moisture resistance, conforming to BS EN 438-4 or NEMA LD3, Grade CGS.
  - 2.3.2.1 Doors: 13 mm (1/2-inch) nominal thickness .
  - 2.3.2.2 Side panels: 10 mm (3/8-inch) nominal thickness.
  - 2.3.2.3 Tops, bottoms and shelves: 13 mm (1/2-inch) nominal thickness.



- 2.3.2.4 End cover panels: 13 mm (1/2-inch) nominal thickness.
- 2.3.2.5 Slope top kits, filler kits and trim kits: 13 mm (1/2-inch) nominal thickness.
- 2.3.2.6 Colours and Finishes: to be selected by Consultant from manufacturer's full range.
- 2.3.3 Hinges: Continuous full length stainless steel, piano hinge fastened to locker door and frame. Hinges to allow 120 degrees opening range.
- 2.3.4 Latching:
  - 2.3.4.1 Provide stainless steel cup handles with an integral door pull, recessed so the locking device does not protrude beyond the door face; ensure handles are pry and vandal resistant.
  - 2.3.4.2 Provide multipoint latching with a finger-lift latch control designed for use with built-in combination locks, built-in key locks, or padlocks; ensure positive automatic latching and prelocking.
- 2.3.5 Locks: To be provided by users
- 2.3.6 Interior Equipment:
  - 2.3.6.1 Double-Tier Lockers: Provide three wall hooks and one ceiling hook.
- 2.3.7 Number Plates: Provide polished aluminum plates with 13 mm (1/2 in) high black numerals, riveted to the door face.
- 2.3.8 Basis-of-Design: "Phenolic Traditional Collection" by ASI Storage Solutions.

## **2.4 AUXILIARY COMPONENTS**

- 2.4.1 Slope top, end panels, fillers and base: to be manufactured of same color and material as locker doors.

## **2.5 FABRICATION**

- 2.5.1 Fabricate phenolic lockers square, rigid, without warp, and with phenolic faces flat and free of dents or distortion. Ensure exposed phenolic edges are safe to touch and free of sharp edges and burrs.
- 2.5.2 Barrier-free lockers: Fabricate barrier-free lockers to conform to the requirements of the Ontario Building Code and CSA B651.

# **PART 3 EXECUTION**

## **3.1 EXAMINATION**

- 3.1.1 Verify actual site conditions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.

## **3.2 INSTALLATION**

- 3.2.1 Installation, generally: Install work of this Section in strict accordance with manufacturer's written installation instructions and reviewed Shop Drawings.

Supplement manufacturer's installation instructions with additional installation requirements specified in this Section to produce specified work results.

- 3.2.2 Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer. Do not install products under environmental conditions outside the manufacturer's specified limits.
- 3.2.3 Shim lockers as required, using concealed shims.
- 3.2.4 Fasten components to adjacent construction through back, near top and bottom. Fasten at indicated height using fasteners recommended by manufacturer. Comply with mounting height requirements for accessible components.

### **3.3 ADJUSTING**

- 3.3.1 Hardware Adjustment: Clean, lubricate, and adjust hardware. Adjust doors and latches to operate easily without binding. Verify that integral locking devices operate properly.

### **3.4 PROTECTION**

- 3.4.1 Protect phenolic lockers from damage, soiling and contaminating substances resulting from construction activities or caused by work of other trades. Do not permit use of lockers during construction.
- 3.4.2 Where soiling or spills have occurred, remove spills and soiling from adjacent surfaces using cleaning procedures recommended in writing by affected material's manufacturer. Do not use materials or process that can damage finishes, surfaces, or construction.
- 3.4.3 Promptly replace phenolic lockers work damaged during construction that cannot be satisfactorily repaired.

### **3.5 CLEANING AND WASTE MANAGEMENT**

- 3.5.1 Cleaning: Maintain clean construction area at the end of each day. When activities of this Section are complete, remove materials, tools, equipment and rubbish.
- 3.5.2 Waste Management and Disposal: sort waste for reuse, recycling, or disposal, as specified. Remove recycling bins and containers from site and dispose of contents at the appropriate waste disposal facilities.

**END OF SECTION**

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## **PART 1      GENERAL**

### **1.1      GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.
- 1.1.2 Contractor is solely responsible for dividing the Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of the Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2      SUMMARY**

- 1.2.1 Provide labour, materials, products, equipment and services to complete the General Requirements for Air Tightness in Isolation and Pressurized Rooms work specified herein. This includes, but is not necessarily limited, to:
  - 1.2.1.1 This section outlines general requirements for airtight construction and sealing of penetrations to achieve minimum pressure differential pa between airborne isolation rooms and adjacent spaces in accordance with requirements of Contract Documents.
- 1.2.2 Related Requirements: Specifications throughout entirety of Divisions of this Project are directly applicable to this Section, and this Section is directly applicable to them.

### **1.3      REFERENCES**

- 1.3.1 Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply.

### **1.4      ADMINISTRATIVE REQUIREMENTS**

- 1.4.1 Pre-Installation Meetings: Prior to starting work of this Section, convene a pre-installation meeting at Project site to review Project requirements and site conditions with pertinent parties. Conform to requirements of Section 01 31 19.

### **1.5      SUBMITTALS**

- 1.5.1 Submittals, generally: in accordance with Section 01 33 00, Submittal Procedures.
- 1.5.2 Product Data: Submit manufacturer's printed literature, specifications and data sheets.
- 1.5.3 Proposed Air Tightness Measures: Submit report, including drawings, product data sheets and samples that indicate measures proposed for providing air tightness in controlled environment rooms. Submit Product Data, Drawings and

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additional materials as required demonstrate compliance with requirements specified in Contract Documents.

- 1.5.3.1 Submit Product Data, Shop Drawings, Samples and Test and Evaluation reports for all materials proposed.

## **1.6 QUALITY ASSURANCE**

### **1.6.1 Qualifications:**

- 1.6.1.1 Manufacturers: Provide Products for Work of this Section by manufacturer with minimum 10 years' experience in the manufacture of such materials.
- 1.6.1.2 Installers: Provide work of this Section executed by competent installers with minimum 5 years' experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.

- 1.6.2 Single Source Responsibility: Ensure primary materials provided in this Section are obtained from 1 source by a single manufacturer and secondary materials are obtained from sources recommended by primary materials manufacturers.

- 1.6.3 Mock-up: If required by Consultant, provide Mock-up to demonstrate quality of workmanship and proposed air sealing measures prior to proceeding with full scale air sealing work. Obtain approval on air sealing techniques in mock-up areas from Consultant. Proceed in other areas only after obtaining Consultant's approval.

## **1.7 DELIVERY, STORAGE, AND HANDLING**

- 1.7.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- 1.7.2 Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- 1.7.3 Store materials in dry locations and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

## **PART 2 PRODUCTS**

### **2.1 DESCRIPTION**

#### **2.1.1 Design and Performance Requirements**

- 2.1.1.1 Ensure construction of all assemblies is airtight. Responsibility for airtight construction falls on Contractor. Employ pertinent details for airtightness and coordinate work between trades to ensure airtightness is achieved.
- 2.1.1.2 Representative details for airtight penetrations, recessed elements, edges, etc. are shown on Drawings. Specific materials and components to be used to accomplish airtight detailing are specified in the technical Specifications (Divisions 02 - 49). Bring to attention of

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Consultant any condition that may require special details or materials in order to achieve airtightness.

- 2.1.1.3 Carefully locate and treat ducts, grilles, diffusers, boxes and other similar mechanical and electrical devices with sealants.
- 2.1.1.4 Provide lintels, extra frames, blocking, escutcheons, grouting, gaskets, packing, caulking, dense putties, taping, filling, etc. as required to make materials airtight. Use flexible sealant or acoustical gasket to seal between assemblies and dissimilar surfaces.
- 2.1.1.5 Extend construction to a minimum of 3 mm (1/8") and a maximum of 13 mm (1/2") of adjacent construction or penetrations to Provide suitable space for packing and caulking.
- 2.1.1.6 Prior to packing and caulking penetrations, verify that all penetrating elements such as piping and ductwork are free and clear of the opening to be packed and caulked.

## **2.2 MATERIALS**

- 2.2.1 Flexible Membrane for isolation and pressurized rooms:
  - 2.2.1.1 CAN/ULC S742 (Class A); with air permeance of <0.01 L/s.m2 per ASTM E2357
  - 2.2.1.2 Basis-of-Design Products: "3M Air and Vapor Barrier 3015" by 3M or approved equivalent.
- 2.2.2 Sprayable Water Based Elastomeric Coating for isolation and pressurized rooms:
  - 2.2.2.1 Paintable Spray applied water-based material conforming to CAN/ULC-S115, ASTM E1966, that dries to form tough elastomeric coating at construction joints and penetration openings and control transmission of noxious gas, fire, heat and smoke.
  - 2.2.2.2 Basis-of-Design Products: "3M Fire Dam Spray 200" by 3M Canada or approved equivalent.
- 2.2.3 Acoustical Sealant for Exposed and Concealed Joints: Conforming to requirements of Section 07 92 00.Nonsag, paintable, nonstaining latex sealant complying with ASTM C834.
  - 2.2.3.1 Basis-of-Design Products (Gun applied, smoke-rated and acoustic sealant): "CP506 – Smoke and Acoustic Sealant" by Hilti (Canada) Limited;
  - 2.2.3.2 Basis-of-Design Products (Sprayed-on Sealant): "CP572 – Smoke and Acoustic Spray" by Hilti or approved equivalent.
- 2.2.4 Air/Vapour Barrier Box:
  - 2.2.4.1 Provide air/vapour barrier box for electrical outlets and penetrations manufactured from low density polyethylene plastic.
  - 2.2.4.2 Basis-of-Design Product: "LESSCO Air-Vapor Barrier Box" by LESSCO; or approved equivalent.

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## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

#### **3.1.1 Site Verification of Conditions:**

- 3.1.1.1 Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.
- 3.1.1.2 Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including removal of packing and back priming.

#### **3.1.2 Evaluation and Assessment:** Commencement of work implies acceptance of previously completed work.

### **3.2 INSTALLATION**

- 3.2.1 Seal area fully to prevent air leakage.
- 3.2.2 Adhere flexible membrane extending continuously from underside of structure to bottom of gypsum board.
- 3.2.3 Adhere flexible membrane in locations identified on drawings to transition from differing materials that are likely to have ongoing movement, such as large pipes, large panels, headwalls and duct penetrations.
- 3.2.4 Conform to ASTM C919 for application of sealants at isolation and pressurized rooms.
- 3.2.5 Apply acoustical sealant to every air gap including but not limited to: gaps around perimeter of wall, gaps between wall panels and gaps around any penetrations made for plumbing or electrical wiring.
- 3.2.6 Seal off piping, electrical output boxes, and ductwork with acoustical treatments.
- 3.2.7 Apply minimum 13 mm (1/2") diameter bead of acoustical sealant continuously around periphery of each face of partition to seal gypsum board/structure junction where partitions abut fixed building components in accordance with manufacturer's recommendations.
- 3.2.8 Partition Bases: Provide continuous bead of sealant at all locations where gypsum board meets structural floor or roof (this includes all sides of partitions). Depth of sealant to be equal thickness of gypsum layer or layers.
- 3.2.9 Partition Heads: Provide the same detail as for bases at flat structure. Refer to Drawings for details for other conditions.
- 3.2.10 Partition or Ceiling Joints at Dissimilar Materials: Provide continuous bead of sealant at all locations where gypsum board meets dissimilar material. Depth of sealant to be equal thickness of gypsum layer or layers.
- 3.2.11 Frames: Apply continuous acoustical sealant around edge of frame on both sides of partitions.

**ISSUED DATE:** 2025-11-20  
**ISSUED FOR:** TENDER

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3.2.12 Pipe, Duct, Conduit, or Structural Penetrations: In accordance with requirements of Division 21,22,23,26 and 27.

3.2.13 Service Boxes: Electrical, Mechanical, IT, Communication:

3.2.13.1 Treat all service boxes, new and existing, with air/vapour barrier box specified in this Section.

3.2.13.2 Refer to Divisions 26 and 27 for additional requirements.

### **3.3 SITE QUALITY CONTROL**

3.3.1 Site Tests and Inspections

3.3.1.1 Engage a qualified independent inspection and testing agency acceptable to Consultant to perform the following special inspections and prepare reports as follows:

- .1 As a minimum, inspect and test assemblies, using Magnehelic® pressure gauges.
- .2 Test assemblies continuously over a 48-hour period.
- .3 Make necessary adjustments to air balancing and sealing to attain requirement.
- .4 Submit test data upon completion.

3.3.1.2 Provide air tightness pressure testing for each isolation room and anteroom separately to confirm negative pressure can be achieved for these rooms.

3.3.1.3 Perform testing upon completion of room sealing, gypsum board installation and door installation but prior to installation of ceilings. If air tightness is not achieved to meet negative pressure requirements reseal all aspects of the room and retest to confirm parameters have been met.

3.3.1.4 Ensure air tightness testing is performed and design parameters have been validated prior to moving onto the next phase of the Work. Do not proceed with construction of a subsequent phase until air tightness has been achieved and signed off by Owner.

**END OF SECTION**

## **PART 1 GENERAL**

### **1.1 GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.
- 1.1.2 Contractor is solely responsible for dividing the Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of the Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2 SUMMARY**

- 1.2.1 Provide seismic control assemblies for operational and functional components including but not limited to following:
  - 1.2.1.1 Work in this section includes supplying and installing complete seismic restraint systems for architectural components. Work in this section may also include the seismic restraint design and/or equipment/product certifications to be submitted for review by the registered design professional.
  - 1.2.1.2 Architectural assemblies or components requiring seismic restraint include, but are not limited to, the following:
    - .1 nonstructural exterior wall components,
    - .2 interior partitions and infill walls,
    - .3 suspended ceiling assemblies and bulkheads,
    - .4 roof-mounted accessories, and similar components,
    - .5 wall-mounted components weighing more than 9 kg (20 lbs)
    - .6 Owner-supplied, Contractor-installed equipment,
    - .7 other components needing seismic restraints and listed in Contract Documents.
- 1.2.2 Related Requirements: Specifications throughout entirety of Divisions of this Project are directly applicable to this Section, and this Section is directly applicable to them.

### **1.3 REFERENCES**

- 1.3.1 Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply.

### **1.4 ADMINISTRATIVE REQUIREMENTS**

- 1.4.1 Sequencing: Coordinate installation with related Sections referenced herein.
- 1.4.2 Pre-Installation Meetings:



- 1.4.2.1 Prior to starting work of this Section, convene a pre-installation meeting at Project site to review Project requirements and site conditions with pertinent parties. Conform to requirements of Section 01 31 00
- 1.4.3 Scheduling:
  - 1.4.3.1 Prior to commencing work of this Section arrange for manufacturer's technical representative to review with Contractor and Consultant, procedures to be adopted and conditions under which work shall be performed. Inspect surfaces to determine adequacy of existing and proposed conditions.
  - 1.4.3.2 Co-operate fully with other Subcontractors on The Work and promptly proceed with work of this Section as rapidly as job conditions permit.
  - 1.4.3.3 Co-operate with other Sections for application of all miscellaneous specialties.
  - 1.4.3.4 Supply items to be built-in in ample time to be incorporated into work of other Subcontractors, together with measurements and other information required for location of it.
  - 1.4.3.5 Ensure work which may create dust does not proceed during work related to painting and final finishing.

## **1.5 SUBMITTALS**

- 1.5.1 Submittals, generally: in accordance with Section 01 33 00, Submittal Procedures.
- 1.5.2 Product Data: Submit manufacturer's literature and data sheets for each type of material provided under this Section for Project in accordance with requirements of Section 01 30 00. Ensure data sheets provide required information including detailed instructions for installing as well as maintaining, preserving and keeping materials in clean and safe conditions. Provide adequate warning of maintenance practices or cleaning agents detrimental to specified materials.
- 1.5.3 Shop Drawings: Submit in accordance with Section 01 33 00 and indicating following:
  - 1.5.3.1 Submit complete seismic restraint design, consisting of calculations, restraint selection, installation details, and other documentation signed and sealed by professional engineer stipulated herein Seismic restraint shop drawings shall be prepared and overseen by a professional engineer as specified herein experienced in designing seismic restraints for operational and functional components as required by the authority having jurisdiction
  - 1.5.3.2 Where walls, floors, slabs, or supplementary steel work is used for seismic restraint, submit details of acceptable attachment methods for equipment and components; including spacing, static loads, and seismic loads at all attachment and support points. Obtain approval of Consultant prior to installation.
  - 1.5.3.3 Provide specific details of seismic restraints and anchors; include number, size, and locations for each piece of equipment; provide

details of suspension supports and restraints for equipment hung from ceiling.

- 1.5.4 Embodied Carbon / Environmental Product Declarations (EPDs): When available, submit product-specific or industry-wide EPDs conforming to ISO 14025 or other recognized environmental Product declaration framework meeting following criteria:
  - 1.5.4.1 EPD Scope: Must cover Cradle-to-Gate (A1 to A3) as a minimum.
  - 1.5.4.2 EPD Impact Categories: Must report Global Warming Potential (GWP) in form of unit of kgCO<sub>2</sub>e/declared unit as a minimum.
  - 1.5.4.3 Product Options: Give preference to Products with compliant documentation when choice is at Contractor's option.
- 1.5.5 Material Ingredient Disclosure: When available, submit documentation disclosing chemical inventory of materials to at least 0.1% (1000ppm) meeting following criteria:
  - 1.5.5.1 Standard: Health Product Declaration (HPD) Open Standard, Cradle to Cradle v2 (Basic level) or Cradle to Cradle v3 (Bronze level), International Living Future Institute (ILFI) Declare, or other approved material ingredient declaration framework.
  - 1.5.5.2 Product Options: Give preference to Products with compliant documentation when choice is at Contractor's option.
- 1.5.6 Low-Emitting Materials: For applicable Products specified or used for activities of this Section (i.e., site-applied coatings, adhesives, and sealants), submit certifications from third-party organizations indicating compliance with following:
  - 1.5.6.1 VOC Emissions: California Department of Public Health (CDPH) Standard Method v1.2–2017, using applicable exposure scenario.
  - 1.5.6.2 VOC Content: SCAQMD Rule 1113 (for paints and coatings) and SCAQMD Rule 1168 (for adhesives and sealants).

## **1.6 QUALITY ASSURANCE**

- 1.6.1 Qualifications:
  - .1 Provide work of this Section by a specialty consultant or equipment manufacturer designated to develop seismic restraint system and perform seismic calculations in accordance with requirements of OBC, standards stipulated herein and additional requirements particular to this Section.
  - .2 Ensure equipment manufacturer or specialty consultant specified herein designs, recommends, reviews, and supervises installation of proposed seismic restraint design and connection methods for entire Project, excluding work associated with Divisions 20, 21, 22, 23 & 26.
- 1.6.2 Licensed Professionals: Employ a full time professional structural engineer registered in the province of Ontario, carrying minimum \$2,000,000.00 professional liability insurance to:

- 1.6.2.1 design the components of the work of this Section requiring structural performance,
- 1.6.2.2 be responsible for full assemblies and connections
- 1.6.2.3 be responsible for production and review of Shop Drawings,
- 1.6.2.4 stamp and sign each shop drawing,
- 1.6.2.5 Provide site administration and inspection of this part of the Work.
- 1.6.2.6 Submit certificate validating seismic assessment and field review of this part of the Work

## **1.7 DELIVERY, STORAGE AND HANDLING**

- 1.7.1 Delivery and Acceptance Requirements: Comply with material manufacturer's ordering instructions and lead time requirements to avoid delays.

## **PART 2 PRODUCTS**

### **2.1 DESCRIPTION**

- 2.1.1 Design and Performance Requirements:
  - 2.1.1.1 Seismic Control Assemblies design is based on mutually agreed upon details submitted by Subcontractor for final review by Consultant.
  - 2.1.1.2 Requirements of this seismic restraint Section are in addition to other requirements specified elsewhere for the support and attachment of operational and functional components. Nothing on Contract Documents shall be interpreted as justification to waive requirements of this Section.
  - 2.1.1.3 In addition to Contract Documents requirements, final design and performance of seismic control and restraint assemblies of operational and functional components and their approval by authorities having jurisdiction is responsibility of this Section.
  - 2.1.1.4 Design seismic restraint system and clearly indicate attachment points to building structure and design forces (in X, Y, and Z direction) at the attachment points in accordance with OBC for designated seismic hazard values for location of Project as listed in Supplementary Standard SB-1. Design anchorage in accordance with ACI 318, Appendix D.
  - 2.1.1.5 Provide attachment loading values to Professional Engineer specified herein for verification of attachment methods and building's structure ability to accept imposed loading. Base seismic restraint design on actual OFC data (dimensions, weight, center of gravity, etc.) obtained from submittals or item manufacturers. Ensure that equipment manufacturer verifies that attachment points on equipment and components can accept combination of seismic loading and other loads imposed.
  - 2.1.1.6 Design seismic restraint system in accordance with OBC requirements and requirements of CAN/CSA S832 based non-exhaustively on the following:

- .1 Anticipated ground motion (including spectral response acceleration as defined by local codes and authorities having jurisdiction);
  - .2 Soil type in specific geographic area
  - .3 Importance Factor of Building (i.e 1.5 for post-disaster buildings)
  - .4 Specific element of component factor
  - .5 Height factor
  - .6 Element's or component's response modification factor
  - .7 Element's or component's weight.
- 2.1.1.7 Include in seismic analysis calculated dead loads, static seismic loads, and capacity of materials utilized for connection of the equipment or system to building structure. Detail anchoring methods, bolt diameter, embedment and welded length. Ensure seismic restraint devices are designed to accept, without failure, forces through components or system's center of gravity.

## **2.2 MATERIALS**

- 2.2.1 Provide manufacturer's standard recommended materials or proprietary systems for seismic bracing and restraint to meet requirements of local codes and authorities having jurisdiction based on design and performance criteria stipulated herein. Provide materials with full published ratings, verified through third party testing and bearing OSHPD pre-approval for use in the State of California.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- 3.1.1 Site Verification of Conditions:
- 3.1.1.1 Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.
- 3.1.2 Evaluation and Assessment: Notify seismic restraint system manufacturer's representative prior to installing seismic restraint devices. Seek manufacturer's guidance regarding unusual installation procedures.

### **3.2 INSTALLATION**

- 3.2.1 Install seismic restraint systems in strict accordance with the manufacturer's written instructions and submittal data specified herein.
- 3.2.2 Ensure installation of seismic restraints do not cause change of position of OFCs resulting in detrimental stresses or misalignment.
- 3.2.3 Coordinate work with other trades to avoid rigid contact with building elements. Bring to attention of Consultant and structural Consultant prior to installation,

conflicts with other trades that may result in rigid contact with equipment due to inadequate space or other unforeseen conditions.

- 3.2.4 Install ceiling suspension and connections components ensuring hanger rods are not subject to bending in accordance with requirements of ASTM E580 and Provide wider wall moulding on all sides to support individual panels around perimeter. Minimum size: 50 mm (2"). Coordinate with Section 09 21 16 and Section 09 51 13.
- 3.2.5 Do not brace seismic restraint system to 2 different structures, such as a wall and a ceiling.
- 3.2.6 Unless otherwise indicated by seismic Consultant specified herein, Provide following seismic mitigation measures to following building elements:
  - 3.2.6.1 Partitions:
    - .1 In buildings with flexible structural frames, anchor partitions to only structural element, such as a floor slab, and separate such partition by physical gap from other structural elements.
    - .2 Properly anchor masonry walls to the structure for restraint, so as to carry lateral loads imposed due to earthquake along with their own weight and other lateral forces.
  - 3.2.6.2 Ceilings And Lighting Fixtures:
    - .1 At regular intervals, laterally brace suspended ceilings against lateral and vertical movements, and provide with a physical separation at the walls.
    - .2 Independently support and laterally brace lighting fixtures. Refer to applicable portion of lighting Specifications.
  - 3.2.6.3 Facades And Glazing:
    - .1 Do not install concrete masonry unit filler walls in a manner that can restrain the lateral deflection of the building frame. Provide a gap with adequately sized resilient filler to separate the structural frame from the non-structural filler wall.
    - .2 Tie brick veneers to a separate wall that is independent of the steel frame as shown on construction drawings to ensure strength against applicable seismic forces at the project location.
    - .3 Install attachments to structure for all façade materials as shown on construction drawings to ensure strength against applicable seismic forces at the project location.

### **3.3 FIELD QUALITY CONTROL**

- 3.3.1 Manufacturers' Field Services:
  - 3.3.1.1 Upon completion of installation of seismic restraint system, have manufacturer's local representative inspect completed system and report in writing any installation errors, improperly selected seismic devices, or other faults which could affect system performance. Perform corrective measures until final approval is granted at no additional cost to Owner.

- 3.3.1.2 Submit, upon request by Consultant, letter of certification signed by professional engineer specified herein substantiating that seismic restraint materials have been properly installed.

### **3.4 CLEANING**

- 3.4.1 Upon completion of installation of seismic restraint materials and before Substantial Performance of The Work, clean debris beneath OFCs and leave Place of The Work in a clean and acceptable condition.

### **3.5 SCHEDULES**

- 3.5.1 As a minimum and unless otherwise determined by specialty consultant specified herein, ensure following items of work are braced and restrained to accommodate seismic loads in accordance with requirements of authorities having jurisdiction, this Section and other governing codes and Standards:
  - 3.5.1.1 Masonry units,
  - 3.5.1.2 Metal fabrications,
  - 3.5.1.3 Architectural woodwork,
  - 3.5.1.4 Canopies,
  - 3.5.1.5 Gypsum wall board partitions and ceilings,
  - 3.5.1.6 Suspended ceiling assemblies,
  - 3.5.1.7 Demountable and operable partitions,

**END OF SECTION**

## **PART 1 GENERAL**

### **1.1 GENERAL INSTRUCTIONS**

- 1.1.1 Read and conform to: The general provisions of the Contract, including General and Supplementary Conditions; the requirements of Division 01 Specifications; and any additional documents referred to in this Section.
- 1.1.2 Contractor is solely responsible for dividing the Work among Subcontractors and Suppliers. Consultant and Owner assume no responsibility to act as arbiters or to establish subcontract limits between Sections or Divisions of the Work. Any references to related work items contained in this Section are provided for convenience only.

### **1.2 SUMMARY**

- 1.2.1 Provide labour, materials, Products, equipment and services to complete the radiation protection work specified herein. This includes, but is not necessarily limited, to:
  - 1.2.1.1 Lead sheet, strip, and plate for field application.
  - 1.2.1.2 Lead bricks for high-dose shielding.
  - 1.2.1.3 Lead-lined gypsum board.
  - 1.2.1.4 Lead-lined hollow-metal frames for doors and observation windows.
  - 1.2.1.5 Lead-lined flush wood doors.
  - 1.2.1.6 Auxiliary materials required for a complete installation.
- 1.2.2 Related Requirements: Specifications throughout all Divisions of the Project shall be read as a whole, and may be directly applicable to this Section. Related requirements provided below are for convenience purposes only:
  - 1.2.2.1 Section 08 11 13 - Hollow Metal Doors and Frames
  - 1.2.2.2 Section 08 14 16 - Flush Wood Doors
  - 1.2.2.3 Section 08 71 00 - Door Hardware
  - 1.2.2.4 Section 09 21 16 - Gypsum Board Assemblies.

### **1.3 DEFINITIONS**

- 1.3.1 Lead Equivalence: The thickness of lead that provides the same attenuation (reduction of radiation) as the material in question under specified conditions.
- 1.3.2 Unless otherwise indicated by the Project Physicist's report, lead equivalence is as measured at an energy level of 150 kilovolt-peak (kVp).

### **1.4 REFERENCES**

- 1.4.1 Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply.

## **1.5 ADMINISTRATIVE REQUIREMENTS**

- 1.5.1 Pre-installation Meetings: Schedule and hold a pre-installation meeting at the Project site before beginning work on this Section to coordinate activities with related Subcontractors.
  - 1.5.1.1 Pre-construction Site Meeting: Convene prior to starting work. Review scope, materials, installation sequence, and quality control.
  - 1.5.1.2 Required Attendees: Consultant, Owner's radiation protection, Contractor, radiation shielding installer, electrical Subcontractor, mechanical Subcontractor, and project physicist.
  - 1.5.1.3 Reporting: Record significant discussions, agreements, and disagreements, including required corrective measures and actions.
  - 1.5.1.4 Distribution: Distribute minutes of the meeting to each party present and to other parties requiring information not more than 72 hours after meeting.

## **1.6 SUBMITTALS**

- 1.6.1 Submittals, generally: in accordance with Section 01 33 00, Submittal Procedures.
- 1.6.2 Product Data: Submit manufacturer's product characteristics, catalogue cuts, installation instructions and other relevant information for each material and product used for radiation protection work specified in this Section.
- 1.6.3 Shop Drawings: Submit Shop Drawings indicating material layouts, details of construction, connections, and relationship with adjacent construction. As a minimum indicate following:
  - 1.6.3.1 Provide large-scale details for all joints, seams, and overlaps to demonstrate continuous, uninterrupted shielding.
  - 1.6.3.2 Show objects that penetrate radiation shield, including ducts, pipes, conduit, and electrical boxes. Include detailed sections of shielding method at each unique penetration type.
  - 1.6.3.3 Include door and frame elevations, profiles, hardware locations, and clearances.
- 1.6.4 Product Schedule: Submit for all doors, frames, and windows, coordinated with the Drawings and the final Door Hardware Schedule.
- 1.6.5 Delegated Design Submittals:
  - 1.6.5.1 Engineering design completion of shielding components and their supports is delegated to Contractor based on structural design criteria indicated in Contract Documents.
  - 1.6.5.2 Submit Shop Drawings for work of this Section that bear the stamp of a Professional Engineer licensed in the province of the project.
  - 1.6.5.3 Submit copy of structural calculations upon request by Consultant.
- 1.6.6 Environmental and Material Transparency:
  - 1.6.6.1 Embodied Carbon / EPDs: When available, Submit EPDs conforming to ISO 14025 or equivalent standard; prioritize products with such documentation when choices are at Contractor's option.



- 1.6.6.2 Material Ingredient Disclosure: When available, submit documentation identifying chemical inventories of materials to at least 0.1% (1000ppm) in accordance with HPD Open Standard, Cradle to Cradle (Basic v2/Bronze v3), ILFI Declare, or equivalent standard; products with such documentation when choices are at Contractor's option.
- 1.6.7 Samples: Submit selection and verification samples for radiation protection work requiring colour, texture, or design selection.
  - 1.6.7.1 As a minimum submit samples of the following:
    - .1 Factory-applied colour finishes for doors and frames.
    - .1 300 mm x 300 mm cut-away corner sample of each type of lead-lined door, showing core construction, lead placement, and edge details.
- 1.6.8 Field Quality Control Submittals: Submit report from Owner's radiation protection specialist upon completion of final radiological survey.

## **1.7 CLOSEOUT SUBMITTALS**

- 1.7.1 Operating and Maintenance Data: Submit care and maintenance instructions for radiation protection to be included in building operation and maintenance manual.
- 1.7.2 Photographic Record: Submit photographic record of all installed radiation shielding, including joints, corners, and penetrations, taken prior to concealment by finishes.

## **1.8 QUALITY ASSURANCE**

- 1.8.1 Installer Qualifications: Engage an entity with sufficient experience installing, erecting, or assembling work similar in material, design, and extent to that shown on Drawings and Schedules, and whose work has resulted in construction with a track record of successful in-service performance for at least five (5) projects of similar scope.
- 1.8.2 Professional Engineer's Qualifications: Employ a Professional Engineer licensed to practice in the province of the project who carries professional liability insurance and has at least five years' experience providing engineering services of similar kind, scope, and complexity.
  - 1.8.2.1 Professional Engineer's Responsibility:
    - .1 production and review of Shop Drawings,
    - .2 design and certification of heavy shielding components and their supports, including attachments for building construction, in accordance with applicable codes and regulations,
    - .3 stamping and signing of each relevant Shop Drawing and associated calculations.
- 1.8.3 Single Source Responsibility: Obtain each primary type of radiation protection product (e.g., all lead-lined gypsum board, all lead-lined doors) from a single manufacturer.

## **1.9 DELIVERY, STORAGE AND HANDLING**

- 1.9.1 Product Requirements, generally: in accordance with Section 01 61 00, Common Product Requirements.
- 1.9.2 Deliver, store, and handle materials in accordance with manufacturer's instructions and WHMIS regulations for lead products. Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- 1.9.3 Protect materials from damage. Store materials off-ground, in a clean, dry, well-ventilated area. Store lead-lined gypsum panels flat. Replace defective or damaged materials with new.

## **1.10 FIELD CONDITIONS**

- 1.10.1 Environmental Restrictions: Do not deliver or install radiation protection until building is enclosed, wet work is complete, and HVAC system is operational and will maintain temperature and relative humidity levels equal to occupancy levels for remainder of construction period.

## **1.11 WARRANTY**

- 1.11.1 Warranty for Lead-Lined Doors: Provide a written warranty, for a period of three (3) years from Substantial Performance, covering defects including warping in excess of WDMA standards and delamination of veneers.

# **PART 2 PRODUCTS**

## **2.1 MANUFACTURERS**

- 2.1.1 Provided requirements of Contract Documents are satisfied, the following manufacturers may supply Products for work this Section:
  - 2.1.1.1 MarShield, Division of Mars Metal Company
  - 2.1.1.2 Ray-Bar Engineering Corp.
  - 2.1.1.3 Ultraray Group Inc.

## **2.2 DESIGN / PERFORMANCE CRITERIA**

- 2.2.1 Radiation Compliance: Provide radiation protection that complies with requirements of the following:
  - 2.2.1.1 National Council of Radiation Protection and Measurement, in particular NCRP Report No. 49 - Structural Shielding Design and Evaluation for Medical Use of X-Rays and Gamma Rays of Energies up to 10 MeV
  - 2.2.1.2 NCRP Report No.102 - Medical X-Ray, Electron Beam and Gamma Ray Protection for Energies up to 50 MeV (Equipment Design, Performance and Use).
- 2.2.2 Provide materials and workmanship to maintain continuous radiation protection in all planes and directions. Match lead thickness to that specified for the surrounding assembly. Do not leave gaps or create unshielded paths.

- 2.2.3 Penetrations: At penetrations of lead sheet linings, install lead shields to maintain continuous protection.
- 2.2.4 Shielding design will be based on the report prepared by the Owner's radiation protection specialist, appended to Section 00 31 00.
- 2.2.5 Lead-Lined Assemblies: Provide lead thickness in doors, door frames, window frames, and other components in lead-lined assemblies not less than that indicated for the associated assemblies unless specified otherwise.
- 2.2.6 Door Hardware: Provide line covers, escutcheons, and plates to shield cut-outs and penetrations in frames. Refer to Section 08 71 00 for additional requirements.
- 2.2.7 Fire-Rated Assemblies: Where specified, provide assemblies tested and certified by a ULC-accredited agency to meet the following:
  - 2.2.7.1 Doors and frames: CAN/ULC-S104.
  - 2.2.7.2 Windows: CAN/ULC-S106.
  - 2.2.7.3 Partitions / Ceilings: CAN/ULC-S101.

## **2.3 SHIELDING MATERIALS**

- 2.3.1 Lead Sheet, Strip, and Plate: ASTM B749, Alloy UNS No. L51121, refined from un-pierced, virgin pig lead complying with ASTM B29, with a minimum purity of 99.9%.
  - 2.3.1.1 Thickness: As noted on Drawings.
- 2.3.2 Lead Bricks: Cast or extruded lead bricks with interlocking tongue-and-groove edges, made from ASTM B29 pig lead with 0.5% antimony added for hardness.
  - 2.3.2.1 Products: Nelco "N-Series Interlocking Lead Brick"; MarShield "Interlocking Lead Bricks"; or approved equivalent.
- 2.3.3 Lead-Lined Gypsum Board: 16 mm (5/8-inch) thick, Type X gypsum board, with single sheet of lead factory-laminated to the back.
  - 2.3.3.1 Edge Detail: Provide with lead lining extending 25 mm (1 inch) beyond one vertical edge to form an integral lap.
  - 2.3.3.2 Lead Equivalence Thickness: As noted on Drawings.
  - 2.3.3.3 Accessories: Provide 50 mm (2-inch) wide lead strips of same thickness for backing non-lapped joints, and lead discs or tabs for covering fastener heads.

## **2.4 LEAD-LINED ASSEMBLIES**

- 2.4.1 Lead-Lined Hollow-Metal Doors and Frames:
  - 2.4.1.1 Doors: Complying with ANSI/NAAMM-HMMA 861 and SDI-100, Grade III, Extra Heavy-Duty lined with a single continuous sheet of lead of thickness as indicated.
  - 2.4.1.2 Frames: Complying with ANSI/NAAMM-HMMA 861, fully welded, from minimum 1.7 mm (14 gauge) steel sheet lined with lead to match door, with lead lapping door stops. Provide heavy-duty reinforcements for hinges and closers.
  - 2.4.1.3 Lead Thickness: To match adjacent assembly in all respects.

**2.4.2 Lead-Lined Flush Wood Doors:**

- 2.4.2.1 Construction: Solid-core wood doors complying with WDMA I.S.1-A, Extra Heavy Duty.
- 2.4.2.2 Core and Lining: Split particleboard core with a single continuous sheet of lead in the center or solid core with lead sheet laminated to each side.
- 2.4.2.3 Lead Thickness: To match adjacent assembly in all respects.
- 2.4.2.4 Faces: High-pressure decorative laminate, color as selected by Consultant to match doors specified in Section 08 14 16 in all respects.

**PART 3 EXECUTION**

**3.1 EXAMINATION**

- 3.1.1 Verify actual site conditions and location of adjacent materials prior to commencing work. Verify substrates are ready and supporting structures are constructed to support the weight of the shielding materials.
- 3.1.2 Notify Consultant in writing of any unsatisfactory conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.

**3.2 INSTALLATION - GENERAL**

- 3.2.1 Installation, generally: Install work of this Section in strict accordance with manufacturer's written installation instructions, reviewed shop drawings, and the Owner's radiation protection specialist's recommendations.
- 3.2.2 Entire system to be installed to eliminate gaps or penetrations that could compromise shielding effectiveness.
- 3.2.3 Hold Point Inspection: Do not conceal radiation shielding with insulation, gypsum board, or other finishes until the installation has been reviewed by Consultant and Owner's radiation protection specialist .

**3.3 INSTALLATION OF LEAD-LINED GYPSUM BOARD**

- 3.3.1 Provide additional framing around full perimeter of sheets and around penetrations (e.g., electrical boxes, conduits, pass-throughs). Shim framing as required to create flat, true substrate for board.
- 3.3.2 Install lead-lined gypsum board with lead facing studs.
- 3.3.3 Joints and Corners: Provide continuous lead strip minimum 50 mm (2 in) wide behind all joints and corners. Center piece behind joint to provide a minimum 25 mm (1 in) overlap onto adjacent sheet.
- 3.3.4 Secure boards with steel screws of length recommended by manufacturer.
- 3.3.5 Screw penetrations must be shielded with lead-headed fasteners. Alternatively, cover screw heads with lead disc or button of same lead thickness as board. Adhere discs securely with high-strength, construction-grade adhesive with full contact.

3.3.6 Penetrations: Line back and sides of penetrations and openings with sheet lead. Lining must be cut to size to create continuous shield that laps onto the wall's lead lining by minimum 25 mm (1 in)

3.3.6.1 Extend lead-lined gypsum board into door and window frames. Overlap adjacent wall shielding by minimum of 25 mm (1 inch) on all sides. Seal with lead wool or sealant as required.

3.3.6.2 Provide lead lined gypsum board to a height of 2100 mm (7') above finished floor, with regular gypsum board above.

### **3.4 INSTALLATION OF LEAD-LINED DOORS AND FRAMES**

3.4.1 Install frames level and plumb. Frame supports must be engineered to handle full operational load of door. For doors with lead 3 mm (1/8 in) thick or greater, provide full-height steel angle supports welded or bolted to structure as required.

3.4.2 Before installation in masonry, apply coat of asphalt mastic or bituminous paint to portion of steel frame that will be in contact with grout or mortar.

3.4.3 Ensure frames are continuously lined with lead of a thickness specified in shielding report or noted on Drawings. Ensure minimum overlap of 25 mm (1 in)

3.4.4 Hardware cutouts (for locks, hinges, and similar components) must be shielded. Provide manufacturer-supplied lead-lined locksets and shielding plates for hardware to ensure no gaps in protection.

### **3.5 INSTALLATION OF PENETRATIONS (PIPES, DUCTS, CONDUITS)**

3.5.1 Penetration shielding details must be installed in strict accordance with reviewed shop drawings and the Owner's radiation specialist's report. Ensure penetrations do not compromise shielding envelope.

3.5.2 Ducts and Pipes: Where ducts or pipes pass through shielded assemblies, ensure they are shielded to prevent radiation scatter.

3.5.2.1 Line or wrap ducts with lead sheet for a distance from the wall equal to three (3) times the largest duct dimension, or as noted on radiation specialist's report.

3.5.2.2 Secure lead sheet with steel bands.

3.5.2.3 For heavy lead shielding on ducts, lead must be independently supported from building structure to prevent overloading ductwork and hangers.

3.5.3 Outlet Boxes and Conduits: Install boxes between studs using mounting brackets.

3.5.3.1 Shield box by applying lead lining to its back and sides or by using a pre-fabricated lead-lined box. Lead must overlap the wall shielding by at least 25 mm (1 in)

3.5.3.2 Wrap conduits lead sheet for a distance from the box as specified by Owner's radiation physicist but not less than 300 mm (12 in)

### **3.6 FIELD QUALITY CONTROL**

3.6.1 Inspection and Testing:

- 3.6.1.1 Owner will engage a qualified independent radiation protection specialist to perform inspections and tests.
- 3.6.1.2 Coordinate with Owner's radiation protection specialist to schedule inspection of complete shielding installation prior to concealment by finishes. Work must be left open and accessible until Owner's radiation protection specialist has completed inspection and provided written acceptance to proceed with concealment.
- 3.6.1.3 Final Radiological Survey: Upon project completion and after the radiation-emitting equipment is operational, Owner's radiation protection specialist will conduct radiological survey.
- 3.6.1.4 Correct deficiencies identified in the Owner's radiation protection specialist's report at no additional cost to the Owner. This includes uncovering, repairing, and refinishing work as necessary to correct the defect. Arrange and pay for re-testing of corrected areas until no deficiencies remain.

### **3.7 PROTECTION**

- 3.7.1 Protect installed work from damage, soiling and contaminating substances resulting from construction activities or caused by work of other trades.
- 3.7.2 Where soiling or spills have occurred, remove spills and soiling from adjacent surfaces using cleaning procedures recommended in writing by affected material's manufacturer. Do not use materials or process that can damage finishes, surfaces, or construction.
- 3.7.3 Promptly replace Architectural Radiation Protection work damaged during construction that cannot be satisfactorily repaired.
- 3.7.4 Secure radiation-protected rooms and limit access to authorized personnel.

### **3.8 CLEANING AND WASTE MANAGEMENT**

- 3.8.1 Cleaning: Maintain clean construction area at the end of each day. When activities of this Section are complete, remove materials, tools, equipment and rubbish.
- 3.8.2 Waste Management and Disposal: sort waste for reuse, recycling, or disposal, as specified. Remove recycling bins and containers from site and dispose of contents at the appropriate waste disposal facilities.

END OF SECTION