



**K WING – LEVEL 1  
EAST WING  
PALLIATIVE CARE UNIT  
Phase 2 Renovation**

**SPECIFICATIONS**

aTRR PROJECT NO.: 2172-14 (2)  
SB PROJECT NO.: 2018-0697

SET # \_\_\_\_\_

ISSUED FOR TENDER

DATE July 10, 2020 (r3)



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## **DIVISION 0 - PROCUREMENT AND CONTRACTING REQUIREMENT**

Section 00 00 00	Cover Page
Section 00 01 10	Table of Contents
Section 00 01 15	List of Drawings
Section 00 21 13	Mandatory Instructions to Bidders
Section 00 31 00	Available Project Information
Section 00 41 13	Stipulated Price Bid Form
Section 00 43 22	Unit Prices Bid Form Supplement
	Appendix A - Asbestos Abatement - Unit rate Schedule
Section 00 43 23	Alternate Prices Bid Form Supplement
Section 00 43 36	List of Subcontractors and Bid Form Supplement
Section 00 73 03	Amendments to CCDC 2-2008

## **DIVISION 01 - GENERAL REQUIREMENTS**

Section 01 00 00	General Requirements
Section 01 21 00	Allowances
Section 01 22 10	Prices
Section 01 25 00	Product Substitution Procedures
Section 01 26 00	Contract Modification and Instruction Procedures
Section 01 31 13	Coordination
Section 01 31 19	Project Meetings
Section 01 32 00	Construction Progress Documentation Schedule
Section 01 32 26	Schedule of Values and Form
Section 01 33 00	Submittals
Section 01 35 23	Owners Rules and Regulation
Section 01 35 26	Safety Requirements
Section 01 35 33	Infection Control During Construction
	Appendix A – Infection Prevention and Control Risk Assessment
	Appendix B – Infection Prevention and Control Monitoring Checklist
	Appendix C – Patient Care Manual
	Appendix D – Patient Care Manual – Mould Response Policy (IP&C and OHS)
Section 01 45 00	Testing & Laboratory Services
Section 01 50 00	Temporary Facilities
Section 01 51 16	Fire Safety Precautions During Construction
Section 01 60 00	Products and Workmanship
Section 01 73 29	Cutting and Restoration
Section 01 74 13	Cleaning
Section 01 77 00	Contract Closeout and Submittals
Section 01 78 36	Warranties
Section 01 91 10	Commissioning

## **DIVISION 02 - EXISTING CONDITIONS**

Section 02 41 19	Selective Demolition
Section 02 82 00	Asbestos Abatement – Scope and Details
Section 02 82 20	Type 2 Asbestos Abatement
Section 02 82 30	Type 3 Asbestos Abatement
	Appendix A – Revised Limited Designated Substance Report – Dec. 2017

## **DIVISION 05 - METALS**

Section 05 50 00	Metal Fabrication
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## **DIVISION 06 – WOOD, PLASTICS, AND COMPOSITES**

Section 06 10 13	Wood Blocking
Section 06 41 11	Architectural Cabinetwork

## **DIVISION 07 - THERMAL AND MOISTURE PROTECTION**

Section 07 81 16	Cementitious Fireproofing
Section 07 84 00	Firestopping
Section 07 92 00	Joint Sealants

## **DIVISION 08 - OPENINGS**

Section 08 11 00	Hollow Metal Doors and Frames
Section 08 14 16	Flush Wood Doors
Section 08 31 13	Access Doors / Panels
Section 08 71 00	Door Hardware- Common Requirements
Section 08 80 50	Glass and Glazing

## **DIVISION 09 - FINISHES**

Section 09 03 95	Terrazzo Restoration
Section 09 21 16	Gypsum Board Assemblies
Section 09 51 13	Acoustic Panel Ceilings
Section 09 65 10	Resilient Flooring
Section 09 91 10	Painting

## **DIVISION 10 - SPECIALTIES**

Section 10 11 00	Visual Display Surfaces
Section 10 14 19	Signage
Section 10 21 24	Cubicle Curtains
Section 10 28 14	Accessories
Section 10 26 13	Wall and Door Protection

## **DIVISION 12- FURNISHINGS**

Section 12 12 30	Art Handling and Display
Section 12 24 00	Window Roller Shades

## **DIVISION 20 – MECHANICAL COMMON WORK RESULTS**

Section 20 05 05	Mechanical Work General Instructions
Section 20 05 10	Basic Mechanical Materials and Methods
Section 20 05 25	Mechanical Insulation
Section 20 05 35	Demolition and Revision Work
Section 20 05 50	Testing, Adjusting and Balancing

## **DIVISION 21 – FIRE SUPPRESSION**

Section 21 13 00	Fire Protection Sprinkler System
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## **DIVISION 22 – PLUMBING**

Section 22 11 00	Domestic Water Piping and Specialties
Section 22 13 00	Drainage and Vent Piping and Specialties
Section 22 43 00	Plumbing Fixtures and Fittings
Section 22 60 00	Medical Gas Piping Systems

## **DIVISION 23 – HEATING, VENTILATING AND AIR CONDITIONING**

Section 23 30 00	HVAC Air Distribution
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**DIVISION 26 – ELETRICAL**

Section 26 00 10	Electrical Work General
Section 26 05 00	Basic Electrical Materials and Methods
Section 26 20 00	Electric Service and Distribution
Section 26 50 00	Lighting
	Appendix A – Luminaire Cutsheets

**DIVISION 27 – COMMUNICATIONS**

Section 27 10 00	Structured Cabling System
	Appendix B – Data Centre and Hub Room Access Policy
Section 27 52 23	Nurse Call

**DIVISION 28 – ELECTRONIC SAFETY AND SECURITY**

Section 28 05 00	Security Systems
Section 28 31 00	Existing Fire Alarm Work

PART 1 LIST OF DRAWINGS

- 1.1 ARCHITECTURAL DRAWING LIST
- 1.2 MECHANICAL DRAWING LIST
- 1.3 ELECTRICAL DRAWING LIST

## PART 1 – LIST OF DRAWINGS

### 1.1 ARCHITECTURAL DRAWING LIST

A-000	Cover Sheet
A-001	Legends, Construction Assemblies & Typical Details
A-002	General Notes, Abbreviations, AV Equipment Schedule & OBC Matrix
A-003	Fire Separation Plan
A-004	Phasing Plans
A-102	Overall Floor Plan - K1E/K1C & KGE/KGC Phasing Plan
A-104D	Partial Demolition Plans
A-105D	Partial Demolition Ceiling Plans
A-201	Partial Floor Plan
A-202	Enlarged Plans & Interior Elevations
A-203	Enlarged Plans & Interior Elevations
A-204	Enlarged Plans & Interior Elevations
A-205	Enlarged Plans & Interior Elevations
A-206	Enlarged Plans & Interior Elevations
A-510	Millwork Details
A-511	Millwork Details
A-601	Reflected Ceiling Plan
A-602	Enlarged Reflected Ceiling Plans & Details
A-701	Room Finish Plans
A-801	Furniture and Equipment Plan
A-901	Door & Frame Schedule And Door & Frame Type

### 1.2 MECHANICAL DRAWING LIST

M-001	Drawing List, Schedule, and Symbol List
M-002	Detail Drawings
M-003	Air Balancing Scope of Work and Reference Drawings
M-004	Air Balancing Reference Drawings
M-101D	Fire Protection And Plumbing - Demolition
M-102D	Medical Gas - Demolition
M-103D	H.V.A.C. – Demolition
M-201	Fire Protection And Plumbing - New Work
M-202	Medical Gas - New Work
M-203	H.V.A.C. - New Work
PM-101D-2A	Fire Protection and Plumbing – Demolition – Phase 2A
PM-101D-2B	Fire Protection and Plumbing – Demolition – Phase 2B
PM-101D-2C	Fire Protection and Plumbing – Demolition – Phase 2C

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PM-101D-2D	Fire Protection and Plumbing – Demolition – Phase 2D
PM-102D-2A	Medical Gas – Demolition – Phase 2A
PM-102D-2B	Medical Gas – Demolition – Phase 2B
PM-102D-2C	Medical Gas – Demolition – Phase 2C
PM-102D-2D	Medical Gas – Demolition – Phase 2D
PM-103D-2A	H.V.A.C. – Demolition – Phase 2A
PM-103D-2B	H.V.A.C. – Demolition – Phase 2B
PM-103D-2C	H.V.A.C. – Demolition – Phase 2C
PM-103D-2D	H.V.A.C. – Demolition – Phase 2D
PM-201-2A	Fire Protection and Plumbing – New Work – Phase 2A
PM-201-2B	Fire Protection and Plumbing – New Work – Phase 2B
PM-201-2C	Fire Protection and Plumbing – New Work – Phase 2C
PM-201-2D	Fire Protection and Plumbing – New Work – Phase 2D
PM-202-2A	Medical Gas – New Work – Phase 2A
PM-202-2B	Medical Gas – New Work – Phase 2B
PM-202-2C	Medical Gas – New Work – Phase 2C
PM-202-2D	Medical Gas – New Work – Phase 2D
PM-203-2A	H.V.A.C. – New Work – Phase 2A
PM-203-2B	H.V.A.C. – New Work – Phase 2B
PM-203-2C	H.V.A.C. – New Work – Phase 2C
PM-203-2D	H.V.A.C. – New Work – Phase 2D

### 1.3 ELECTRICAL DRAWING LIST

E-001	Symbol List, Drawing List, Details And General Notes
E-002	Lighting Control Schematic Diagrams
E-003	Luminaire Schedule, Panel Schedules – New & Existing Panels
E-004	Panel Schedules – New Panels
E-101	Palliative Care K1E Lighting - New Work
E-102	Palliative Care K1E Power & Communications - New Work
E-103	Palliative Care K1E Systems - New Work
E-201	Palliative Care K1E Lighting - Demolition
E-202	Palliative Care K1E Power & Communciations- Demolition
E-203	Palliative Care K1E Systems - Demolition

END OF SECTION

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**MANDATORY INSTRUCTIONS TO BIDDERS  
00 21 13  
SUBMISSION INSTRUCTIONS FOR BIDDERS**

Please follow these instructions to submit via our Public Portal.

**1. PREPARE YOUR SUBMISSION MATERIALS:**

Requested Information

Name	Type	# Files	Requirement
Submission	File Type: PDF (.pdf)	Multiple	Required

**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://sunnybrook.bonfirehub.ca/projects/view/14769>

Your submission must be uploaded prior to the Closing Time **September 23<sup>RD</sup>, 2020, 2:00:00pm** (Toronto Time). We strongly recommend that you give yourself sufficient time and **at least ONE (1) hour** before Closing Time to begin the process and to finalize your submission.

**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 11, Microsoft Edge, Google Chrome, or Mozilla Firefox. Javascript must be enabled. Browser cookies must be enabled.

**Need Help?**

Sunnybrook Health Sciences Centre uses a Bonfire portal for accepting and evaluating tenders digitally. Please contact Bonfire at [Support@GoBonfire.com](mailto:Support@GoBonfire.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 Request for Tender Sunnybrook Palliative Care – Phase 2 for Sunnybrook Health Sciences Centre (the “Owner”).

Room Renovations for Sunnybrook Health Sciences Centre (the “Owner)

Only Prequalified General Contractors may submit bid submissions on this Tender. The Prequalified General Contractors, from RFSQ SB 2019-8012:

- EllisDon
- Maystar General Contractors Inc.
- REA Construction Ltd
- Dineen Construction Corporation
- Gillam Group Inc.
- MJ Dixon Construction Limited
- Elite Construction Inc.

Only Prequalified Mechanical Subcontractors from RFSQ SB 2019-8012 can be named as subcontractors on this project:”

- Black & McDonald Ltd.
- Bird Mechanical Ltd.
- English and Mould Mechanical Systems Ltd.
- Pipe All Plumbing & Heating Limited
- Battaglia Mechanical Systems
- Geo. A. Kelson Co. Ltd.
- VR Mechanical Services Inc.
- Plan Group Inc.
- Urban Mechanical Ltd.

Only Prequalified Electrical Subcontractors from RFSQ SB 2019-8012 can be named as subcontractors on this project:

- Black McDonald Ltd.
- Ontario Electrical Construction Company Limited
- Danik Electrical Construction Company Limited
- Plan Group Inc.

A mandatory formal briefing meeting and site tour will be held at date and time and location as stipulated in Invitation to Bidders. All General Contractors and Mechanical/Electrical Subcontractors must attend the Mandatory Formal Briefing Meeting and Site Tour. The Formal Briefing and Site Tour is **on September 3, 2020. Bidders must RSVP for a tour time before 12:00 noon on August 31, 2020, by emailing [elli.fusco@sunnybrook.ca](mailto:elli.fusco@sunnybrook.ca). Bidders will be assigned a tour time only once RSVP is received.**

The Owner reserves the right to call a second site tour, if required.

Submission requirements: Submission must be in accordance with the Drawings and Specifications included with these Submission Documents for

Sunnybrook Palliative Care – Phase 2  
**At Sunnybrook Health Sciences Centre**  
3075 Bayview Avenue, Toronto ON M4N 3M5

And will be received:

Prior to **2:00:00 o'clock p.m.**, local time, **September 23, 2020**. Bids will not be publicly opened.

Submission must consist of:

- .1 Stipulated Price Bid Form Section 00 41 13
- .2 Alternate Prices Bid Form Supplement Section 00 43 23
- .3 Unit Prices Bid Form Supplement Section 00 43 22
- .4 Unit Prices Bid Form Supplement – Appendix A – Asbestos Abatement Unit Rate Schedule Section 00 43 22
- .5 Bid Security Section 00 21 13 Part 12.2
- .6 Agreement to Bond 00 21 13 Part 12.2
- .7 List of Subcontractors Bid Form Supplement Section – 00 43 36 (note: General Contractors are advised that it is expected they will carry similarly qualified mechanical and electrical subtrades, and their experience will be verified).
- .8 Hazmat Acknowledgement Form in Section 01 35 23
- .9 Time of the essence acknowledgement document
- .10 Resumes of general contractors, assigned project manager and site superintendent (must be approved by the owner).

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.

Bid forms must be completed without delineation, alteration or erasures and there is to be no re-capitulation of the work to be done.

Bids must be for a Stipulated Sum without escalation clauses or other qualifications.

Prices must exclude: Harmonized Sales Tax where indicated.

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 Sunnybrook Bonfire Portal described on page 1.

Paragraph 1.1.3 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 1.1.3 will be rejected.

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.

Submissions will not be opened until the Owner is in receipt of the submissions

## 1.2 DESCRIPTION OF THE WORKS

Sunnybrook Palliative Care – Phase 2 consists of renovating patient room, team stations, corridors and staff areas. Demolition is limited to the area. Under this project the areas are to be renovated are located in K1E Wing.

Sequence of work within these areas and timelines have been identified and detailed in the Tender documents. As a general summary, construction sequencing would unfold as follows:

- .1 Phase 2A must be completed and occupied before Phase 2B can start.
- .2 Phase 2B must be completed and occupied before Phase 2C can start.
- .3 Phase 2C must be completed and occupied before Phase 2D can start.

## 1.3 CONSTRUCTION SCHEDULE

Contractor to provide schedule (in weeks) for each phase of construction as well as the over construction duration.

## 1.4 EVALUATION PROCESS

The evaluation of Tenders will be conducted by the evaluation team in several stages as described below.

Stage I Mandatory Requirements	
<b>Review of Mandatory Requirements</b>	<b>Pass/Fail</b>
Submission requirements: Submission must be in accordance with the Drawings and Specifications included with these Submission Documents for:  Sunnybrook Palliative Care – Phase 2 <b>At Sunnybrook Health Sciences Centre</b> 3075 Bayview Avenue, Toronto ON M4N 3M5  And will be received  <b>Prior to 02:00:00 o'clock p.m., local time September 23, 2020. Bids will not be publicly opened. Bids must be submitted via the Sunnybrook Bonfire Portal as instructed in this document.</b>	
Stage II Price	

Contractor to submit final detailed construction schedule for owner approval written 10 working days of contract award.

Contractor to allow for a 2-week (10 working days) period for owner move-in between the completion of each phase of work and the start of the next phase.

## 1.5 TIE BREAK PROCESS

Where two or more submission achieve a tie (exact same price), the Owner will break the tie by informing the tied Bidders and asking for a resubmission of Bid Price within 2 business days.

## PART 2 CONTRACTORS / SUB-CONTRACTORS

Bidders must submit on the Bid Form, identified list of all sub-contractors and corresponding costs to whom it is proposed to sublet any part of the work.

Bidder must name only one Subcontractor for each trade Section.

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.

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.

Immediately after notice of Contract award, the successful Bidder must notify it's named Subcontractors that they have been named.

The list of sub-contractors set forth must not 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.

## **PART 3 QUESTIONS DURING BIDDING**

### **3.1 DOCUMENT REVIEW**

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.

### **3.2 QUESTIONS DURING THE BIDDING PERIOD MUST BE SOLELY DIRECTED TO:**

Elli Fusco, Email: [Elli.Fusco@Sunnybrook.ca](mailto:Elli.Fusco@Sunnybrook.ca)

Bidders seeking information with regard to organization of documents and clarification and interpretation of information on drawings or in specification may contact only the Tender Calling Authority by email and questions will be collected, collated, printed and answered by published, written Addenda.

Bidders seeking information with regard to the organization of the documents and location of information on drawings or in specification may contact only the Tender Calling Authority by email.

No 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 e-mailed to the Tender Calling Authority not less than seven (7) days before date set for receipt of Bids.

E-mailed questions will be collected, collated, printed and answered by published, posted written Addenda

Bidders must not contact the Owner, its employees, or its agents, including the Engineering Consultant, except via the Tender Calling Authority in regards to this Tender.

Under no circumstances must the Bidder rely upon any information or instructions from the Owner, its employees, or its agents, including the Engineering Consultant, unless the information or instructions are provided in writing by the Tender Calling Authority; and

The Owner, its employees and/or its agents, including the Engineering 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.

## PART 4 ADDENDA

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.

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.

## PART 5 EXAMINATION OF SITE

### 5.1 MANDATORY FORMAL BRIEFING MEETING AND SITE TOUR

A mandatory formal briefing meeting and site tour will be held at date and time and location as stipulated in Invitation to Bidders. Owner has the right to call a second mandatory site meeting if deemed necessary. (Note: both meetings are mandatory) All General Contractors and Mechanical/Electrical Subcontractors must attend the Mandatory Formal Briefing Meetings and Site Tours.

**September 3, 2020 via RSVP only, in the cafeteria on the ground level of K Wing. Email [elli.fusco@sunnybrook.ca](mailto:elli.fusco@sunnybrook.ca) for a tour time. Please RSVP before noon on August 31, 2020.** Purpose of the meetings is to review full extent of the Project, conduct an inspection of existing premises and to discuss any questions regarding this Project.

One representative(s) from each Bidding Contractor must attend. The minutes of this pre-Bid meeting listing attendees may be issued as an Addendum.

It is mandatory that General Contractors, Mechanical and Electrical Subcontractors attend the meeting. All other Subcontractors are also invited to attend.

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.

Also ascertain the extent, nature and location of concealed services which may have to be protected, removed or relocated. Claims to extras relating to concealed conditions (behind access hatches, above ceiling tiles, service rooms, etc.) that could've been exposed for investigation during the site visit will not be accepted.

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.

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.

If extra site visits are required in addition to the mandatory site meeting noted on item .2 above, request and schedule with Owner to view areas.

### 5.2 SITE VISITS

In addition to paragraph 5.1, 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.

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.

## PART 6 ALTERNATIVE PRICES BID FORM SUPPLEMENT

Refer to section 00 43 23 of specification.

## PART 7 SUBMISSION

Submission of Bids to constitute proof of the Bidder's inclusion in the submission 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.

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.

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 Submission or any Submission 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.

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.

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.

## PART 8 RESERVED RIGHTS OF THE OWNER

Bids not received as per the Submission Instructions will be disqualified and will not be accepted by the Owner.

Bids received from any Bidder that has outstanding unresolved construction project deficiencies or documented unsatisfactory completion of work, with respect to any previous contract or submission may be rejected at the sole discretion of the Owner.

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.

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.

Bids received from any other Bidder that has a claim or legal proceeding against the Owner with respect to any previous contract or submission may be rejected at the sole discretion of the Owner

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.

The Owner reserves the right, in Owner's sole discretion, to cancel this tender at any time without awarding a Contract to any Bidder.

The Owner reserves the right to disregard all non-confirming, non-responsive and conditional bids.

The Owner reserves the right to contact any or all references, whether or not the references are documented by the Contractor as part of this submission.

The Owner reserves the right to negotiate Contract terms with the lowest compliant Bidder or Bidders, or should the Owner not receive any satisfactory or compliant bids, to negotiate a Contract in accordance with paragraph 12.4 (below).

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.

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.

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.

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

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.

## **PART 9 WITHDRAWAL AND ACCEPTANCE OF BIDS**

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.

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 150 days after the time and date fixed for delivering bids, whichever occurs first (the "Bid Acceptance Period").

The 150 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 150th day thereafter. If the 150th day falls on a Saturday, Sunday or statutory holiday, such day or days must be omitted from the computation.

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 in the Owner's view 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.

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.

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.

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.

Award of Contract will be by written notification to the successful Bidder

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.

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.

## PART 10 ERROR IN BIDS

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.

## PART 11 CONTRACT

The successful Bidder must be required to sign, in triplicate, Canadian Standard Construction Document CCDC 2-2008 for Stipulated Price Contract, as amended by Section 00 07 03, as bound herein, and return the executed Contract to the Owner within seven (7) days after award of Contract by Owner.

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. **No work shall commence until the Owner acknowledges receipt of the executed Contract, and all required Bonds and Certificates of Insurance.**



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**Claims for extra payment and extension to Contract Time as a result of failure to provide documents noted above will not be considered by the Owner.**

## **PART 12 BONDS AND INSURANCE**

### **12.1 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 50% of the bid price, and in the forms as follows:

- .1 Performance Bond: Canadian standard construction document CCDC 221.
- .2 Labour and Material Payment Bond: Canadian standard construction document CCDC 222.
- .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.

### **12.2 BID SECURITY**

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.

Bidders must attach and submit bid security together with Bid Form.

The Bid Bond must be in force for a period of 150 days from day fixed for receiving bids.

Bid Bonds must be in accordance with the Canadian Construction Documents Committee (CCDC) Standard Form of Bid Bond, CCDC Document No. 220 – Bid Bond.

Bid Bonds must be issued by a duly incorporated surety company authorized to transact business in the Province of Ontario.

Bid bonds must be properly executed by both Bidder and Surety.

If a Bidder whose bid is accepted by the Owner, within the specified 150 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.

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

Bids submitted without Bid Security will be disqualified.

### **12.3 LABOUR AND MATERIALS PAYMENT BOND (MANDATORY REQUIREMENTS)**

Bidders must include with their Bid agreements to Bond for 50% labour and materials payment.

Agreement to bond must be valid for the bid acceptance period.

Bidders must submit security to Owner within 7 days of date of receiving notification that Bidder has been awarded Contract but before signing Contract. No work can commence before submission of security and Owner's acknowledgement of receipt in writing. Delays and damages caused as a result of failure to provide security in a timely manner will be the responsibility of the Bidder.

Labour and Material Payment Bond must be in accordance with the Canadian Construction Documents Committee (CCDC) Standard Form of Labour and Material Payment Bond, CCDC Document No. 222.

Labour and Material Payment Bond must be issued by a duly incorporated surety company authorized to transact business in the Province of Ontario.

Labour and Material Payment Bond must be issued by Surety Company acceptable to the Owner.

Labour and Material Payment Bond must be properly executed by both the Bidder and Surety Company.

Submission of the Labour and Material Payment Bond must be a pre-condition to commencement of the Work.

#### 12.4 PERFORMANCE BOND (MANDATORY REQUIREMENTS)

Bidders must include with their Bid agreements to Bond for 50% performance.

Agreement to bond must be valid for the bid acceptance period.

Security in the form of a bank letter of credit is not acceptable.

Bidders must submit security to the Owner within 7 days of the date of receiving notification that Bidder has been awarded Contract but before signing Contract. No work can commence before submission of security and Owner's acknowledgement of receipt in writing. Delays and damages caused as a result of failure to provide security in a timely manner will be the responsibility of the Bidder.

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.

Performance Bond must be issued by a duly incorporated surety company authorized to transact business in the Province of Ontario.

Performance Bond must be issued by Surety Company acceptable to the Owner.

Performance Bond must be properly executed by both the Contractor and Surety Company.

Submission of the Performance Bond must be a pre-condition to commencement of the Work.

Insurance documents shall meet the requirements of CCDC 2 – 2008, as amended by 00 73 03 – Supplementary General Conditions.

#### PART 13 BID DOCUMENTS

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.

After the Contract is signed the successful Bidder will be given five complete sets of Specifications and Drawings in addition to the signed and sealed Contract Document set.

#### PART 14 MATERIALS AND EQUIPMENT

Bids must be based upon materials and equipment of manufacture, type and design specified.

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.

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Material and equipment, considered equal to that specified, may be proposed at time of Bidding. When requested, submit specifications, information and details of proposals.

## PART 15 INTERPRETATIONS AND MODIFICATIONS OF BID DOCUMENTS

Submit questions about the meaning and intent of the Bid Documents to the Bid Administrator

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.

**Question deadline is September 14, 2020.**

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 without legal effect.

The Owner and Consultant will not recognize nor participate in any electronic project management program.

## PART 16 CUTTING AND REMEDIAL WORK

Refer to General Conditions regarding cutting and remedial work.

Bidders must include costs for cutting and remedial work in their bid price.

Bidders must obtain required information from their various Subcontractors requiring such cutting and remedial work prior to submission of bid.

## PART 17 REVIEW OF BID DOCUMENTS

No parts of the Bid Documents must be issued by General Contractors to any Subcontractors or material or equipment Supplier, for bidding purposes without Section 00 73 03 and Division 1, General Requirements, being attached thereto.

General 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.

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.

While every effort has been made to show or note the extent of the work in the Contract Documents, the General Contractor by submitting its bid acknowledges the complexities involved in a Project of this size and type.

It is therefore imperative that the General 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.

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.

## **PART 18 OVERTIME COSTS**

Bids have been requested only from General 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.

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.

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.

## **PART 19 INFECTION CONTROL DURING CONSTRUCTION**

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

Owner'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.

## **PART 20 AREAS OF WORK – OVERLAPPING OF CONSTRUCTION SITES**

There is other construction projects occurring throughout the Hospital. It is important that the work of this contract be separate from the work occurring concurrently as Sunnybrook does not want to take on the role of constructor. Follow the guideline/rules set out in the Occupational Health and Safety Act regarding role of constructor. If for any reason there is a need to enter the construction site of another contractor, notify the Hospital before hand and arrangements will be made.

## **PART 21 STAFF**

All General 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.

## **PART 22 COLD WEATHER WORKING**

Particular attentions 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.

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.

## **PART 23 CASH ALLOWANCES**

Bidders must indicate on the Bid Form any Cash Allowances listed thereon. These Cash Allowances are to serve as a basis for payment for certain portions of the work that will be described in greater detail as the project progresses. Work to be performed under the Cash Allowances will be defined through the Contract Change process and payment will be authorized from the Cash Allowance.

Credit the unexpended portion of the cash allowances to the Owner on completion of the Project.

The Owner reserves the right to relocate amounts from various cash allowances, as they see fit.

Identified cash allowances are exclusive of HST.

## **PART 24 SCHEDULING OF WORK (MANDATORY REQUIREMENTS)**

Time is the essence of this Contract. The Bidder must indicate in the space provided on the Bid Form the time to mobilize before commencing the work after award of Contract and the time to complete the work after commencing. **Bids submitted without this information will be deemed Disqualified.**

## **PART 25 DEBRIEFING**

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 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.

## **PART 26 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' Bid Protest Process is subject to the relevant Bid Protest terms as set out in the AIT and Ontario-Quebec Procurement Agreement.

## **PART 27 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. 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.

## **PART 28 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.

## **PART 29 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.cbbc.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.

### **PART 30 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.

### **TIME OF THE ESSENCE ACKNOWLEDGEMENT FORM**

Adhering to the Scheduling Timelines is critical in this project. Therefore, we are asking Contractors to sign this Time of the Essence Acknowledgement Form.

Sequence of work within these areas and timelines have been identified and detailed in the submission documents. As a general summary, construction sequencing would unfold as follows:

1. Phase 2A must be completed and occupied before Phase 2B can start.
2. Phase 2B must be completed and occupied before Phase 2C can start
3. Phase 2C must be completed and occupied before Phase 2D can start

Note: The above is a high level timeline/phasing summary; Contractors are to refer to construction timeline/phasing details in the tender documents for complete information.

Substantial completion for this project will occur at the end of Phase 4.

Within one week of receiving letter of award successful contractor agrees to submit timelines for each phase.

By signing this form, the Contractor acknowledges the extreme importance of adhering to the Scheduling Timeline submitted as part of the Bid Submission.

Signed by: \_\_\_\_\_

Date: \_\_\_\_\_

Witness: \_\_\_\_\_

**END OF SECTION**

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## PART 1 – GENERAL

### 1.1 GENERAL

- .1 Examine the Place of the Work for the existing conditions, matters and limitations relating to the scope of work such as but not exclusively: access to egress to and from the Place of the Work, adjacent buildings, obstructions, services, actual and proposed grade (levels), soil conditions, landscaping, parking areas, services, and rights and interests of other parties affecting the deployment of the Place of the Work and the work to be done thereon.
- .2 Be responsible to ensure that the Subcontractors shall also conduct a thorough examination and have full knowledge of conditions at the Place of the Work affecting their work.
- .3 No payments for extra work will be entertained nor allowed during the execution of the Work for conditions at the Place of the Work and construction techniques, methods, materials and other facets of the construction related to the scope of work that were known, knowable, or reasonably inferable from a thorough examination of the Bid Documents, the Place of the Work or any combination of aforementioned prior to the Bid Closing Time.

### 1.2 INFORMATION AVAILABLE FOR REVIEW

- .1 Be advised the neither the Owner nor the Consultant guarantees the accuracy or completeness of any data contained therein. Bidders must satisfy themselves with regard to all matters relating to conditions that may affect either the methods of construction or the cost of the Work before submitting bids or commencing the Work.
- .2 The architect's seal, if applied to the Project Manual, governs only Section 00 31 00 proper, and not the documents listed herein.
- .3 The following documents are made available for review:
  - .1 Hazardous materials/designated substances report(s):
    - .1 "Revised Limited Designated Substance Survey Report (Renovation Areas), K1E Project, Sunnybrook Health Sciences Centre, 2075 Bayview Avenue, Toronto, Ontario, M4N 3M5", dated December 2017, prepared by Maple Environmental Inc.
    - .2 "OHE Consultants Asbestos Survey Report Annual Update 2016, Sunnybrook Health Sciences Centre K Wing" OHE Project No. 21215
  - .2 Availability of existing documents:
    - .1 Copies of existing documents are available for review at the Owner's Office.
    - .2 Existing documents are available to Contractor for information purposes only, solely for the purpose of placing Contractor in receipt of available data, and are not part of the Contract Documents.
    - .3 Existing document's information shall not be considered a representation or warrant as to actual conditions.
- .4 Contractor must confirm receipt of these documents prior to commencement of construction.

**END OF SECTION**



**Project/Contract:** Sunnybrook Campus – Palliative Care Unit, K Wing, Level 1 (East) – Phase 2

**From (Bidder):** \_\_\_\_\_  
company name  
\_\_\_\_\_  
street address or postal box number  
\_\_\_\_\_  
city/town, province and postal code

**To (Owner):** Mr. Ray Annetta, Project Manager  
Sunnybrook Health Sciences Centre  
2075 Bayview Avenue  
Room G359  
Toronto, Ontario  
M4N 3M5

A. We, the undersigned, having examined the *Bid Documents* for the above named project/contract, including Addendum Number(s) \_\_\_\_\_ to \_\_\_\_\_ (inclusive) and having visited the *Place of the Work*, hereby offer to perform the *Work* in accordance with the *Bid Documents*, for the stipulated (base bid) price of:

\$ \_\_\_\_\_ in Canadian dollars, excluding *Value Added Taxes*.  
(amount in figures)

\$ \_\_\_\_\_ (amount in words)  
in Canadian dollars, excluding *Value Added Taxes*.

a. For this project the *Value Added Taxes* shall mean HST at 13% and any other applicable taxes.

B. We declare that:

i. we will attain the following dates for completion of the *Work* as follows:

a. *Substantial Performance of the Work* within \_\_\_\_\_ weeks after receiving notice of Contract award.

b. *Total Completion Date* within \_\_\_\_\_ weeks after receiving notice of Contract award.

C. We understand and declare that:

a. we have arrived at the bid without collusion with any competitor,

b. the bid is open to acceptance by the *Owner* for a period of 150 days from the date of bid closing,

c. all bid form supplements called for by the *Bid Documents* form an integral part of this bid,

- 
- d. we accept and agree that we shall perform work expeditiously and with adequate forces to attain *Substantial Performance of the Work*, and *Total Completion Date* within the completion time specified in *Bid Documents*. In order to maintain schedule we have allowed for overtime work in our bid price,
- e. 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*.
- f. 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*.
- g. we agree to assign \_\_\_\_\_ (name) as our full-time project manager for duration of the *Contract*.
- h. we agree to assign \_\_\_\_\_ (name) as our full-time superintendent for duration of the *Contract*.
- i. we agree to assign \_\_\_\_\_ (name) as our full-time site coordinator for mechanical and electrical work for duration of the *Contract*.
- j. we agree to *Provide* the following sheet flooring product  
\_\_\_\_\_ (Product name) as manufactured by  
\_\_\_\_\_ (name) and the following sheet flooring  
manufacturers approved installer as the flooring *Subcontractor*,  
\_\_\_\_\_ (name).
- k. We have carefully reviewed and fully understand the *Bid Documents* (including the *Instructions to Bidders*), and, in particular, acknowledge the rights of the *Owner* expressly reserved in the *Instructions to Bidders*, to accept or reject any or all of the bids.

**Signatures:**

Signed and submitted by:

\_\_\_\_\_  
company name

\_\_\_\_\_  
name and title of authorized signing officer

\_\_\_\_\_  
signature of authorized signing officer

\_\_\_\_\_  
name of witness

\_\_\_\_\_  
signature of witness

name and title of authorized signing officer

\_\_\_\_\_  
signature of authorized signing officer

\_\_\_\_\_  
name of witness

\_\_\_\_\_  
signature of witness

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

Note: Affix corporate seal as required by *Bid Documents*.

**END OF SECTION**

**HAZMAT ACKNOWLEDGEMENT FORM**  
**SUNNYBROOK HEALTH SCIENCES CENTRE**

**CONTRACTOR'S ACKNOWLEDGEMENT**

- .1 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.
- .2 If awarded this contract, the Contractor, as Contractor within the meaning of the OHS Act, undertakes:
  - .1 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;
  - .2 to notify Sunnybrook and project consultant of the presence of any potentially hazardous materials, odour 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;
  - .3 to ensure that other contractors and all subcontractors retained to supply services for the Project or the work notify Sunnybrook and project consultant of the presence of any potentially hazardous materials odour 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.
- .3 Contractor:
  - 3.1 Contract to be performed:
    - .1 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.

## NOTICE OF DESIGNATED SUBSTANCES

.1 the following Designated Substances are present at Sunnybrook Health Sciences Centre as outlined in the 'Limited Designated Substance Survey Report' dated June 27, 2019 by Maple Environmental Inc.

Designated Substance

Location

Issued for Tender

## **NOTICE OF BIOLOGICAL, CHEMICAL AND PHYSICAL HAZARDS**

### **Biological:**

Sunnybrook Health Sciences Centre (Sunnybrook) is a fully functioning hospital and medical research facility. As such any biological hazard that could infect a person outside the facility can be expected within the facility. This includes any communicable or non-communicable disease.

### **Physical Hazards:**

Sunnybrook also contains physical hazards common to all public buildings. Contractors, their employees, and subcontractors must be aware of the general hazards associated with any kind of work in a full service public facility with residential living.

In addition to "normal" physical hazards there are also specific departmental hazards. Contractors must make their employees and subcontractors aware of the hazards they may encounter and the safety precautions to take. Contractors are required to contact SHSC departmental managers, and/or the safety office, and/or the Corporate Planning and Development or maintenance project manager regarding any specific hazards.

### **Chemical Hazards:**

In addition to the designated substances mentioned under The Notice of Designated Substances there are approximately 5000 WHMIS regulated chemicals at Sunnybrook and several thousand chemicals covered by The Food and Drug Act, The Pest Control Act, The Atomic Energy Control Act, and the Explosives Act. All contractors are required to have their workers WHMIS trained to work on the premises. Contractors are required to contact SHSC departmental managers, and/or the safety office, and/or the Corporate Planning and Development or maintenance project manager regarding any specific hazards.

Issued for Tender

PROJECT / CONTRACT: PROPOSED PALLIATIVE CARE – PHASE 2

FROM (BIDDER): \_\_\_\_\_

**Company Name**

We, the above named bidder, offer the unit prices requested below. The amount to be added to, or deducted from, our bid price (as entered in Section 00 41 13, previously submitted) is entered for each unit price requested.

**SCHEDULE OF UNIT PRICES**

- .1 Asbestos Abatement:
  - .1 Refer to "ASBESTOS ABATEMENT – UNIT RATE SCHEDULE" attached.
  
- .2 Patient TV and bracket:
  - .1 32" Patient TV and bracket:
    - .1 Supply and installation of patient TV and bracket:  
\$ \_\_\_\_\_
  - .2 43" Patient TV and bracket:
    - .1 Supply and installation of patient TV and bracket:  
\$ \_\_\_\_\_
  
- .3 Access panels:
  - .1 Ceiling access panels, non-fire rated, as specified in Section 08 3113
    - .1 Supply and installation: \$ \_\_\_\_\_
  - .2 Ceiling access panels, fire rated, as specified in Section 08 3113
    - .1 Supply and installation: \$ \_\_\_\_\_
  - .3 Wall access panels, non-fire rated, as specified in Section 08 3113
    - .1 Supply and installation: \$ \_\_\_\_\_
  - .4 Wall access panels, fire rated, as specified in Section 08 3113
    - .1 Supply and installation: \$ \_\_\_\_\_

**END OF SECTION**

00 43 22 Unit Prices Bid Form Supplement

APPENDIX A - ASBESTOS ABATEMENT

UNIT RATE SCHEDULE

The following Unit Rates will apply to additional work not specified in the Contract Documents or for quantities exceeding those specified. Unit Rate to include all Labour, Materials, and Disbursements including Site mobilization and any mark-up.

DESCRIPTION OF WORK	UNIT RATE
Remove and dispose of asbestos-containing parging cement from up to five (5) pipe Fittings using Type 2 procedures or Glove Bag removal methods as specified in Section 02 82 00. Fittings to be re-insulated. Based on 2" nominal line.	\$ _____ per 5 fittings
Remove and dispose of up to ten (10) linear feet of asbestos-containing pipe insulation using Type 2 procedures or Glove Bag removal methods as specified in Section 02 82 00. Fittings to be re-insulated. Based on 2" nominal line.	\$ _____ per 10 linear feet
Remove and dispose of asbestos-containing parging cement from up to five (5) pipe Fittings using Type 2 procedures or Glove Bag removal methods as specified in Section 02 82 00. Fittings to be re-insulated. Based on 6" nominal line.	\$ _____ per 5 fittings
Remove and dispose of up to ten (10) linear feet of asbestos-containing pipe insulation using Type 2 procedures or Glove Bag removal methods as specified in Section 02 82 00. Fittings to be re-insulated. Based on 6" nominal line.	\$ _____ per 10 linear feet
Provide standard labour rates for personnel anticipated to perform work on project.	Asbestos Labourer (253W) \$ _____ per Hour
	Asbestos Supervisor (253S) \$ _____ per Hour
	Project Manager \$ _____ per Hour



PROJECT / CONTRACT:                   SUNNYBROOK PALLIATIVE CARE – PHASE 2

FROM (BIDDER):

\_\_\_\_\_

**Company Name**

We, the above named bidder, offer the alternate prices requested below. The amount to be added to, or deducted from, our base bid price (as entered in the Bid Form) is entered for each alternative requested. All alternative prices exclude *Value Added Taxes*. If there is no change to the base bid price for an alternative, we have so indicated. It is understood that:

- a.       the *Owner* may accept the alternatives and corresponding alternative prices in the following order, including all or none,
- b.       alternative prices will be taken into account in determining the lowest bidder,
- c.       alternatives and alternative prices are open for acceptance by the *Owner* for the same period of time as the base bid price unless otherwise indicated,
- d.       the *Work of the Contract* and the *Contract Price* will reflect the alternatives and alternative prices, if any, accepted by the *Owner* at the time of *Contract* award, and
- e.       acceptance of any alternatives will not affect the base bid contract completion time, unless we have specifically indicated an increase or decrease in time, in number of days, on account of a particular alternative.

**DESCRIPTION OF ALTERNATIVE**

**EFFECT ON BASE BID PRICE:**

**Alternative Price No. 1**

Provide alternate price to substitute all sheet flooring with FORBO as noted:

1. RS1 to be: Collection: Eternal Wood  
Code: 11542  
Colour: Traditional Oak
2. RS2 to be: Collection: Eternal Wood  
Code: 10452  
Colour: Dark Oak
3. RS2 to be: Collection: Eternal Wood (to be confirmed)  
Code: 11962  
Colour: Limed Oak

This alternative price amounts to:

\$ \_\_\_\_\_

**Alternative Price No. 2**

Provide alternate price to leave existing ceramic tiles in place on all walls in Room K1E20.

This alternative price amounts to:

\$ \_\_\_\_\_

**Alternative Price No. 3**

Provide alternate price to substitute gypsum ceilings in all 3-bed patient rooms with CGC ensemble monolithic acoustical ceiling system.

This alternative price amounts to:

\$ \_\_\_\_\_

**Alternative Price No. 4**

Provide alternate price to substitute gypsum ceilings in all 2-bed patient rooms with CGC ensemble monolithic acoustical ceiling system

This alternative price amounts to:

\$ \_\_\_\_\_

**END OF SECTION**

**Project/Contract:** Sunnybrook Campus – Palliative Care Unit, K Wing, Level 1 (East)- Phase 2

**From (Bidder):** \_\_\_\_\_  
company name

We, the above named bidder, 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.

Once Section 00 43 36 - List of Subcontractors and Cost Breakdown Bid Form Supplement has been submitted in accordance with the requirements of Section 00 21 13, the *Subcontractors* listed may not be changed.

Palliative Care Unit, K Wing, Level 1 (East) – Phase 2		
<u>Divisions/Sections</u>	<u>Name of Subcontractor</u> (List identified Subcontractors)	<u>Contractor's Cost</u>
<b>DIVISION 0</b>		
Asbestos Abatement .....		\$ _____
<b>DIVISION 2</b>		
Selective Demolition _____		\$ _____
<b>DIVISION 5</b>		
Metal Fabrication _____		\$ _____
<b>DIVISION 6</b>		
Architectural Cabinetwork _____		\$ _____
<b>DIVISION 7</b>		
Firestopping _____		\$ _____
<b>DIVISION 8</b>		
Doors and Frames _____		\$ _____
Hardware _____		\$ _____
<b>DIVISION 9</b>		
Gypsum/Acoustic _____		\$ _____
Resilient flooring _____		\$ _____
Field Painting _____		\$ _____
<b>DIVISION 10</b>		
Corner Guards and Wall Protection _____		\$ _____
<b>DIVISION 11</b>		
Ceiling Mounted Patient Lift Relocation  (including all new supports) _____		\$ _____
<b>DIVISION 21, 22 AND 23</b>		

Mechanical _____	\$ _____
Sprinklers _____	\$ _____
<b>DIVISION 26, 27 AND 28</b>	
Electrical _____	\$ _____
<b>DIVISION 27</b>	
I.T. Communication Systems Cabling _____	\$ _____
I.T. Communications Systems Rough-Ins _____	\$ _____

END OF SECTION

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## GENERAL REFERENCE

*This Agreement may be executed in any number of counterparts. Each executed counterpart shall be deemed to be an original. All executed counterparts taken together shall constitute one agreement. Receipt of an electronic version of an executed signature page by a Party shall constitute satisfactory evidence of execution of this Agreement by such Party*

The Standard Construction Document, CCDC 2 - 2008, 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 - 2008.

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 - 2008, Stipulated Price Contract. The Stipulated Price Contract, CCDC 2 - 2008, is amended as follows:

### 1. GENERAL

- 1.1 These Supplementary Conditions and Amendments shall modify, delete and/or add to the Agreement between the Owner and the Contractor, Definitions and General Conditions of the Stipulated Price Contract CCDC 2-2008.
- 1.2 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.
- 1.3 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.

### 2. AGREEMENT BETWEEN OWNER AND CONTRACTOR

#### 2.1 ARTICLE A-1 THE WORK

- 2.1.1 Delete paragraph 1.3 and insert 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 *Substantial Performance of the Work*, by the \_\_\_\_\_ day of \_\_\_\_\_ in the year \_\_\_\_\_.; and attain the *Total Completion Date*, by the \_\_\_\_\_ day of \_\_\_\_\_ in the year \_\_\_\_\_.

#### 2.2 ARTICLE A-5 PAYMENT

- 2.2.1 Change paragraph 5.1: In line 3, insert "ten" before "percent ", and insert "10" before "%".

2.2.2 Delete paragraph 5.1.2 and insert new paragraph 5.1.2 to read as follows:

5.1.2 upon *Substantial Performance of the Work*, as certified by the *Consultant*, sixty one (61) days after the publication of the certificate of substantial performance and there being no claims for lien registered against the Project, and the conditions of GC 5.4.5 have been satisfied, and subject to GC 5.5, pay to the *Contractor* the unpaid balance of the holdback amount when due together with such Value Added Taxes as may be applicable to such, and

2.2.3 Delete and insert new paragraph 5.3.1(1) to read as follows:

5.3.1(1) Royal Bank of Canada Prime Lending Rate plus two percent (2%), commencing the date that the payment was due.

2.2.4 Delete paragraph 5.3.1(2).

### 2.3 ARTICLE A-8 SUCCESSION

2.3.1 Amend paragraph 8.1 in line 4, insert “permitted” before “assigns”.

### 2.4 ARTICLE A-9 TIME OF THE ESSENCE

2.4.1 Insert new Article A-9 as follows:

9.1 It is agreed that one of the reasons why the *Contractor* was selected for the *Work* is the *Contractor’s* representation and warranty that it will attain *Substantial Performance of the Work* and the *Total Completion Date* by the date set out in Article A-1, paragraph 1.3 and the *Contractor* acknowledges that it has been advised by the *Owner* that it is critical to the *Owner* that *Substantial Performance of the Work* be achieved by the prescribed date and that time is of the essence of this *Contract*.

## 3. DEFINITIONS

3.1 Add the following new definitions 27, 28, 29, 30, 31 and 32:

3.1.1 27. Submittals

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

28. Hazardous Substances

*Hazardous Substances* are any substances including, without limitation, any solid, liquid, gas, odour, heat, sound, vibration or radiation, mould, bacteria or any combination thereof which may impair the natural environment, injure or damage property, plant or animal life, or harm or impair the health of any person, and includes any substances recognized or characterized as hazardous or toxic under applicable law.

29. OHSA

The term “OHSA” shall refer to the *Occupational Health and Safety Act* R.S.O. 1990 c.0-.1. as amended, and all regulations passed thereunder.

30. Commissioning

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

31. Completion of Commissioning

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

32. Total Completion Date

*Total Completion Date* is the date stipulated in paragraph 1.3 of Article A – 1 of the Agreement – THE WORK and means the point in time when the *Work* is totally performed in accordance with the *Contract Documents* and certified as such by the *Consultant*. The date for *Total Completion Date* shall only be amended in writing by the *Owner*.

**GC 1.1 GENERAL CONDITIONS OF THE STIPULATED PRICE CONTRACT**

.1 Add new subparagraph 1.1.7.5:

1.1.7.5 in case of discrepancies, noted materials and annotations shall take precedence over graphic indications in the *Contract Documents*.

.2 Delete paragraph 1.1.8 in its entirety and substitute new paragraph 1.1.8:

1.1.8 The *Owner* shall provide the *Contractor*, without charge, five (5) sets of the *Contract Documents* to perform the *Work*.

.3 Delete paragraph 1.1.9 in its entirety and substitute new paragraph 1.1.9:

1.1.9 The design information furnished to the *Contractor* as part of the *Contract Documents*, including the *Drawings* and *Specifications*, are the property of the *Owner* and/or the *Consultant*, and are to be used by the *Contractor* only for the purposes of performing the *Work*. The *Contractor* shall not copy, alter or utilize the aforesaid design information for any purpose unrelated to the *Work* without written authorization from the *Owner* and the *Consultant*.

**GC 1.5 PROJECT REQUIREMENTS**

.1 Add new paragraph 1.5.1:

1.5.1 The *Contractor* represents, covenants and warrants to the *Owner* that:

- .1 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;
- .2 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



- 3.6, subject to the *Owner's* approval, in the event of death, incapacity, termination or resignation;
- .3 there are no pending, threatened or anticipated claims or litigation involving the *Contractor* that would have a material adverse effect on the financial ability of the *Contractor* to perform the *Work*; and
- .4 it will achieve *Substantial Performance of the Work* and the *Total Completion Date* by the date set out in Article A-1, paragraph 1.3.

## GC 2.2 ROLE OF THE CONSULTANT

- .1 Add the word "schedules" after the word "techniques" in paragraph 2.2.6.
- .2 Add to the end of the second sentence of paragraph 2.2.6 "or to adhere to the construction schedule".
- .3 Amend paragraph 2.2.7 by deleting "Except with respect to GC 5.1 – FINANCING INFORMATION REQUIRED OF THE OWNER" and capitalizing "the".
- .4 Amend paragraph 2.2.8 by inserting "*Contractor* or *Owner* on its own behalf or on behalf of" after the word "by" in the second line.

## GC 2.3 REVIEW AND INSPECTION OF THE WORK

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

## GC 2.4 DEFECTIVE WORK

- .1 Amend paragraph 2.4.1 by adding the following to the end of the paragraph:  
"2.4.1 The *Contractor* shall rectify in a manner acceptable to the *Owner* all other defective work and like deficiencies throughout the *Work* whether or not they are specifically identified by the *Consultant*."
- .2 Add new paragraphs 2.4.4, 2.4.5 and 2.4.6:
  - 2.4.4 The *Contractor* shall prioritize the correction of any defective work which, in the sole discretion of the *Owner*, adversely affects the day to day operation of the *Owner*.
  - 2.4.5 Upon notification of a defect in the *Work*, the *Contractor* shall, within five working days, promptly provide a written statement outlining the proposed remedial measures and a schedule for implementation. Once approved by the *Consultant*, the *Contractor* shall proceed with

the remedial measures without adversely affecting the construction schedule.

- 2.4.6 Notwithstanding any rejection of the *Work* by the *Consultant* or deduction of an amount otherwise due to the *Contractor* by the *Owner* as a result of defective work, the *Contractor* is required to continue the *Work* in accordance with the *Contract Documents*.

### GC 3.1 CONTROL OF THE WORK

- .1 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”.
- .2 Add new paragraph 3.1.3:
- 3.1.3 Prior to commencing procurement, or fabrication construction activities, the *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, the *Contractor* shall immediately notify the *Consultant*, in writing, and obtain written instructions from the *Consultant* before proceeding with any part of the affected work.

### GC 3.2 CONSTRUCTION BY OWNER OR OTHER CONTRACTORS

- .1 Delete subparagraph 3.2.2.1 in its entirety
- .2 Delete subparagraph 3.2.2.2 in its entirety
- .3 Add new subparagraph 3.2.3.4:
- 3.2.3.4 Subject to GC 9.4 CONSTRUCTION SAFETY, for the *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 *Occupational Health and Safety Act*.
- .4 Add new subparagraphs 3.2.7 and 3.2.8:
- 3.2.7 Entry by the *Owner’s* forces and by other contractors does not indicate acceptance of the *Work* and does not relieve the *Contractor* of any responsibility under the *Contract* including the responsibility to complete the *Work*.
- 3.2.8 Placing, installing, application and connection of work by the *Owner’s* own forces or by other contractors, on and to the *Work* will not relieve the *Contractor’s* responsibility to provide and maintain the specified warranties unless a defect has been created by the *Owner’s* own forces or *Owner’s* other contractors.

#### GC 3.4 DOCUMENT REVIEW

- .1 Delete paragraph 3.4.1 in its entirety and substitute new paragraph 3.4.1:
- 3.4.1 Applying the standard of care described in paragraph 1.5.1, the *Contractor* shall review the *Contract Documents* and promptly report to the *Consultant* any error, inconsistency or omission the *Contractor* may discover or any doubt as to meaning or intent the *Contractor* may have. Except for its obligation to make such review and report the result, the *Contractor* does not assume any responsibility to the *Owner* or to the *Consultant* for the accuracy of the *Contract Documents*. If the *Contractor* does discover any error, inconsistency or omission in the *Contract Documents*, or if the *Contractor* has any doubt as to meaning or intent of any part thereof, the *Contractor* shall not proceed with the *Work* affected until the *Contractor* has received direction from the *Consultant*.
- 3.4.2 Neither the *Owner* nor the *Consultant* will be responsible for oral instructions.

#### GC 3.5 CONSTRUCTION SCHEDULE

- .1 Delete paragraph 3.5.1 in its entirety and substitute new paragraph 3.5.1:
- 3.5.1 The *Contractor* shall,
- .1 Unless it is required to be submitted earlier in accordance with Division 1 of the Specifications, then prior to submitting the first application for payment, submit to the *Owner* and the *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 the *Owner* and the *Consultant*, the construction schedule submitted by the *Contractor* shall become the baseline construction schedule;
- .2 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 3.5.1.1 or any successor or revised schedule accepted by the *Owner* pursuant to this GC 3.5;
- .3 Monitor the progress of the *Work* on a weekly basis relative to the construction schedule, reviewed and accepted pursuant to paragraph 3.5.1.1, or any successor or revised schedule accepted in writing by the *Owner* pursuant to GC 3.5, update the construction schedule on a monthly basis and advise the *Consultant* and the *Owner* in writing of any variation from the baseline construction schedule or slippage in the baseline construction schedule; and

- .4 If, after applying the expertise and resources required under paragraph 3.5.1.2, the *Contractor* forms the view that the slippage in baseline construction schedule reported in paragraph 3.5.1.3 cannot be recovered by the *Contractor*, it shall, in the same notice provided under paragraph 3.5.1.3, indicate to the *Consultant* and the *Owner* if the *Contractor* intends to apply for an extension of *Contract Time* as provided in PART 6 - CHANGES IN THE WORK.

- .2 Add new paragraph 3.5.2:

3.5.2 If at any time it should appear to the *Owner* or the *Consultant* that the actual progress of the *Work* is behind schedule or is likely to become behind schedule, or if the *Contractor* has given notice to that effect to the *Owner* or the *Consultant* pursuant to 3.5.1.3, the *Contractor* shall take appropriate steps to cause the actual progress of the *Work* to conform to the schedule and shall produce and present to the *Owner* and the *Consultant* a recovery plan demonstrating how the *Contractor* will achieve the recovery of the schedule. The *Owner* may instruct the *Contractor*, at the *Contractor's* expense, to employ additional labour and equipment or work overtime or employ any other reasonable procedures, at no expense to the *Owner*, to bring the *Work* back to conform with the schedule.

## GC 3.6 SUPERVISION

- .1 Delete paragraph 3.6.1 in its entirety and substitute new paragraph 3.6.1:

3.6.1 The *Contractor* shall employ competent project managers, superintendents, coordinators and other personnel referred to in the Instructions to Bidders and Stipulated Price Bid Form who will not be removed or replaced during the course of the *Work* without the written consent of the *Owner*, which approval shall not be unreasonably withheld. Should any of the *Contractor's* personnel prove to be unacceptable to the *Owner*, the *Owner* shall give written notice to the *Contractor* who shall, within seven days of receipt of the written notice, immediately make arrangements to appoint a replacement acceptable to the *Owner*.

- .2 Add new paragraph 3.6.3:

3.6.3 The *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 the *Consultant* and all deficiencies in the *Work* have been rectified to the satisfaction of the *Owner*. The full-time site superintendent for the *Contract* named in the Stipulated Price Bid Form and any acceptable replacement shall represent the *Contractor* at the *Place of the Work* and notices and instructions given to the site superintendent for the *Contract* by the *Consultant* shall be held to have been received by the *Contractor*.

### GC 3.7 SUBCONTRACTORS AND SUPPLIERS

- .1 Amend paragraph 3.7.2 by inserting the following at the end of the paragraph “The *Contractor* agrees not to change *Subcontractors* without prior written approval of the *Owner*. Where the *Contractor* wishes to change identified *Subcontractors* or *Suppliers*, it shall set out in writing to the *Owner* sufficient reasons for the desired change. If the *Owner* is not satisfied with the *Contractor's* reason for wanting to change an identified *Subcontractor* or *Supplier*, it shall have the *Consultant* notify the *Contractor* that its request is not acceptable to the *Owner* and that the *Contractor* is required to proceed with the identified *Subcontractor* or *Supplier*.”
- .2 Amend 3.7.4 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 which case the *Contractor* will not be entitled to any change in *Contract Price* or *Contract Time*”.

### GC 3.8 LABOUR AND PRODUCTS

- .1 Add new paragraph 3.8.4:
  - 3.8.4 The *Contractor* is responsible for the safe on-site storage of *Products* and their protection (including *Products* supplied by the *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 the *Owner* and the *Consultant*. The *Owner* shall provide all relevant information on the *Products* to be supplied by the *Owner*.

### GC 3.9 DOCUMENTS AT THE SITE

- .1 Delete paragraph 3.9.1 in its entirety and substitute new paragraph 3.9.1:
  - 3.9.1 The *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 the *Owner* and *Consultant*.

### GC 3.10 SHOP DRAWINGS

- .1 Add the words “AND OTHER SUBMITTALS” to the Title after SHOP DRAWINGS.
- .2 Add “and *Submittals*” after the words “*Shop Drawings*” in clauses 3.10.1, 3.10.2, 3.10.4, 3.10.7, 3.10.8, 3.10.8.2, 3.10.9, 3.10.10, and 3.10.11.
- .3 Delete paragraph 3.10.3 in its entirety and substitute new paragraph 3.10.3:
  - 3.10.3 Prior to the first application for payment, the *Contractor* and the *Consultant* shall jointly prepare a schedule of the dates for submission and return of *Shop Drawings* and any *Submittals*.
- .4 Amend paragraph 3.10.7 by adding the following to the end of the provision:

“For greater certainty, the *Contractor* shall be responsible for all costs associated with making any such submission and obtaining any associated

permits or approvals, including costs associated with any review or inspection and any permit fees, trade or otherwise.”

- .5 Delete subparagraph 3.10.8.1 in its entirety and substitute new subparagraph 3.10.8.1:

3.10.8.1 the *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

- .6 Delete paragraph 3.10.12 in its entirety and substitute new paragraph 3.10.12:

3.10.12 The *Consultant* will review and return *Shop Drawings* and *Submittals* in accordance with the schedule agreed upon in 3.10.3, or, in the absence of such schedule, within 15 business days. If, for any reason, the *Consultant* cannot process them within the agreed-upon schedule or within 15 business days, the *Consultant* shall notify the *Contractor* and they shall meet to review and arrive at an acceptable revised schedule for processing. The *Contractor* shall update the *Shop Drawings* and *Submittals* schedule to correspond to changes in the construction schedule.

### GC 3.13 CLEANUP

- .1 Add in paragraph 3.13.1 “on a daily basis” after “shall” in the first line.

### GC 3.14 RIGHT OF ENTRY

- .1 Add new GC 3.14 RIGHT OF ENTRY

3.14.1 The *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 *Substantial Performance of the Work*, if, in the opinion of the *Consultant* and *Owner*, such entry or occupation does not prevent or substantially interfere with the *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 the *Contractor* from responsibility to complete the *Contract* or its obligations under the *Contract*.

3.14.2 The use or occupancy of the *Work* or any part thereof by the *Owner* shall not be taken in any manner as an acceptance by the *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 the *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 the *Owner* or by persons for whom the *Owner* is responsible. In particular, without limiting the generality of the foregoing, the use or occupancy of the *Work* or any part thereof by the *Owner* shall not release the *Contractor* from liability, or waive or impair any rights of the *Owner*.

#### GC 4.1 CASH ALLOWANCES

- .1
- .1 Delete paragraph 4.1.5 in its entirety and substitute new paragraph 4.1.5
  - 4.1.5 The net amount of any unexpended cash allowances, after providing for any reallocations as contemplated in paragraph 4.1.4, shall be deducted from the *Contract Price by Change Order* without any adjustment for the *Contractor's* overhead and profit on such amount.
- .2 Delete paragraph 4.1.7 in its entirety and substitute new paragraph 4.1.7.
  - 4.1.7 The *Contractor* shall provide a schedule prior to the first application for progress payment that shows when the *Owner* must authorize ordering of items called for under cash allowances to avoid delaying the progress of the *Work*.
- .3 Add new paragraph 4.1.8:
  - 4.1.8 The *Owner* reserves the right to call, or to have the *Contractor* call, competitive bids for portions of the *Work*, to be paid for from cash allowances. If the *Owner* determines to proceed with competitive bids, the *Contractor* shall comply with the directions of the *Owner*.

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

- .1 Amend the heading, “GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER” to read, “GC 5.1 FINANCING INFORMATION REQUIRED”.
- .2 Delete paragraph 5.1.1 in its entirety and substitute a new paragraph 5.1.1:
  - 5.1.1 The *Owner* and *Contractor* shall provide each other with timely *Notice in Writing* of any material change in their financial ability to fulfil their respective obligations under the *Contract*.
- .4 Delete paragraph 5.1.2 in its entirety.

#### GC 5.2 APPLICATIONS FOR PROGRESS PAYMENT

- .1 Delete paragraph 5.2.1 in its entirety and substitute a new paragraph 5.2.1:
  - 5.2.1 Applications for payment on account as provided in Article A-5 of the Agreement – PAYMENT shall include a “Proper Invoice” (as that term is defined in the Construction Act). As a prerequisite to payment, a Proper invoice shall be delivered in accordance with the *Construction Act* to the *Owner* and *Consultant* by the first day of every month for the previous month’s work.
- .2 Amend paragraph 5.2.2 by deleting “Applications for payment” and substitute “A Proper Invoice”.
- .3 Amend paragraph 5.2.3 by deleting “delivered to” and substitute “incorporated into”.
- .4 Amend paragraph 5.2.4 by deleting “first application for payment” and substitute “the first Proper Invoice” and by inserting at the end of the paragraph the following:
  - 5.2.4 The format of the schedule of values shall be in accordance with Section 01 32 26 of the *Contract Specifications*.

- .5 Add to the end of paragraph 5.2.7 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 the *Contractor* until *Substantial Performance of the Work* notwithstanding that title has passed to the *Owner* pursuant to GC 13.1 OWNERSHIP OF MATERIALS.
- .6 Add new paragraph 5.2.8, 5.2.9 and 5.2.10:
- 5.2.8 The *Contractor* shall submit, with each Proper Invoice, as a true condition precedent to the *Contractor's* right to payment under this *Contract* after the first proper invoice, a Statutory Declaration, on an original form of 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.
- 5.2.9 The *Contractor* shall submit Workplace Safety & Insurance Board Clearance Certificate with each proper invoice (as that term is defined in the *Construction Act*).
- 5.2.10 The *Contractor* shall prepare and maintain current as-built *Drawings* which shall consist of the *Drawings* and *Specifications* revised by the *Contractor* during the *Work*, showing changes to the *Drawings* and *Specifications*, which current as-built *Drawings* shall be maintained by the *Contractor* and made available to the *Consultant* for review with each proper invoice (as that term is defined in the *Construction Act*). The *Consultant* reserves the right to retain a reasonable amount for the value of the as-built *Drawings* not presented for review.

#### GC 5.3 PROGRESS PAYMENT

- .1 Amend paragraph 5.3.1 by adding the words "including a Proper Invoice" after "an application for payment".
- .2 Delete from the first line of subparagraph 5.3.1.2, the words, "calendar days" and substitute the words "*Working Days*".
- .2 Delete subparagraph 5.3.1.3 in its entirety and substitute new subparagraph:  
5.3.1.3 Subject to any notice of non-payment delivered by the *Owner* under the *Construction Act*, the *Owner* shall make payment to the *Contractor* on account as provided in Article A-5 of the Agreement – PAYMENT no later than 28 days after receiving a Proper Invoice from the *Contractor*.

#### GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK

- .1 Amend paragraph 5.4.2 by deleting the words "20 calendar days" and substituting the words "fifteen (15) *Working Days*" therefor.
- .2 Delete paragraph 5.4.3 in its entirety and substitute new paragraph 5.4.3:  
5.4.3 Immediately following the issuance of the certificate of *Substantial Performance of the Work*, the *Contractor*, in consultation with the *Consultant*, shall establish reasonable dates for finishing the *Work*



and correcting any deficient *Work*, which in any event shall be consistent with the scheduled Total Completion Date.

.3 Add new paragraph 5.4.4 and 5.4.5:

5.4.4 The *Contractor* shall publish, in a construction trade newspaper in the area of the location of the *Work*, a copy of the Certificate of *Substantial Performance of the Work* within seven (7) days of receiving a copy of the Certificate signed by the *Consultant*, and the *Contractor* shall provide suitable evidence of the publication to the *Consultant* and *Owner*. If the *Contractor* fails to publish such notice, the *Owner* shall be at liberty to publish and back charge the *Contractor* its costs for doing so.

5.4.5 For the purposes of *Substantial Performance of the Work* and subsection 2(1) of the Ontario *Construction Act* relating to the meaning of substantial performance, the *Contractor* acknowledges that the improvement required by this *Contract*, cannot be considered “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* and the municipal government, utilities and other authorities having jurisdiction.

#### GC 5.5 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF THE WORK

- .1 Add new subparagraphs 5.5.1.3, 5.5.1.4 and 5.5.1.5:
  - 5.5.1.3 Submit a written request for release of holdback including a declaration that no written notices of lien have been received by it.
  - 5.5.1.4 Submit a Statutory Declaration CCDC 9A-2001
  - 5.5.1.5 Submit Workplace Safety & Insurance Board Clearance Certificate.
- .2 Delete from line 1 of paragraph 5.5.2, the words, “the statement” and substitute the words “the documents”.
- .3 Delete paragraph 5.5.3.
- .4 Delete paragraphs 5.5.4 and 5.5.5 and substitute new paragraph 5.5.4:
  - 5.5.4 The holdback amount authorized by the certificate for payment of holdback referred to in paragraph 5.5.2 is due and payable, subject to paragraph 5.8, following the expiry of the applicable time period for the preservation of construction liens, provided that no construction liens or certificates of action have been registered against the title to the *Place of the Work*, and the *Owner* has not received any written notices of lien in respect of the *Work*.

#### GC 5.6 PROGRESSIVE RELEASE OF HOLDBACK

- .1 Delete paragraphs 5.6.1, 5.6.2 and 5.6.3 in their entirety.

#### GC 5.7 FINAL PAYMENT

- .1 Delete paragraph 5.7.1 in its entirety and substitute new paragraph 5.7.1:
  - 5.7.1 When the *Contractor* considers that the *Work* is completed and satisfies the requirements of *Total Completion Date* and *Completion of Commissioning*, the *Contractor* shall submit an application for final payment. The *Contractor’s* application for final payment shall be accompanied by a Proper Invoice and any documents or materials not yet delivered as agreed to in writing by the *Owner* pursuant to paragraph 5.4.5 together with fully complete as-built *Drawings*. Should the *Contractor* fail to deliver any of the said documents, or other documents required to be delivered pursuant to the *Contract Documents*, the *Owner* shall be at liberty to withhold from amounts otherwise payable to the *Contractor*, an amount, in the discretion of the *Owner*, up to the full amount otherwise payable to the *Contractor* as security for the obligation of the *Contractor* to deliver the undelivered documents.

- .2 Delete from the first line of paragraph 5.7.2 the words, “calendar days” and substitute the words “Working Days”.
- .3 Delete paragraph 5.7.4 in its entirety and substitute new paragraph 5.7.4:
- 5.7.4 “Subject to the other requirements of the *Contract* and the requirements of the *Construction Act*, the unpaid balance of the *Contract Price* shall become payable to the *Contractor* on the later of: (i) the expiration of the statutory limitation period stipulated in the *Ontario Construction Act*; and (ii) the 10<sup>th</sup> *Working Day* following the issuance of the *Consultant’s* final certificate for payment; and; subject to the *Owner’s* right to withhold payment from the unpaid balance of the *Contract Price* for any amounts required pursuant to GC 5.8 WITHHOLDING OF PAYMENT, and any sums required to satisfy any lien or trust claims arising from the *Work*”.
- .4 Add new paragraph 5.7.5:
- 5.7.5 As additional preconditions for release of the final payment, the *Contractor* shall submit the following documentation:
- .1 *Contractor’s* written request for release of final payment, including a declaration that no written notices of lien have been received by it.
- .2 *Contractor’s* Statutory Declaration CCDC 9A-2001.
- .3 *Contractor’s* Workplace Safety & Insurance Board Clearance Certificate.

## GC 5.8 WITHHOLDING OF PAYMENT

- .1 Add new paragraph GC 5.8.2:
- 5.8.2 Notwithstanding the provisions of GC 5.3 PROGRESS PAYMENT, GC 5.5 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF THE WORK and GC 5.7 FINAL PAYMENT, the *Owner* may withhold payment of any amounts otherwise due under the *Contract* on account of any costs or damages the *Owner* has incurred or, is likely to incur, by reason of:
- .1 defective or incomplete portions of the *Work* or damage to the work of other contractors not rectified in accordance with the *Contract*;
- .2 failure of the *Contractor* to indemnify the *Owner* in accordance with the terms of the *Contract*;
- .3 failure of the *Contractor* to fulfil its obligations in respect of construction liens in accordance with GC 13.2;
- .4 evidence of the *Contractor’s* failure to make payments to *Subcontractors* or *Suppliers*;
- .5 unsatisfactory prosecution of the *Work* by the *Contractor* or any *Subcontractor*; and

.6 failure to attain the *Contract Time*.

Add new paragraph GC 5.8.3:

5.8.3 Where the *Owner* has withheld payment of any portion of the *Contract Price* pursuant to the provision of paragraphs 5.8.2 or 5.8.2, the *Owner* shall be entitled to apply such withheld portion towards any costs or damages suffered by the *Owner*.

## GC 6.1 OWNER'S RIGHT TO MAKE CHANGES

.1 Add the following new paragraphs:

6.1.3 With respect to the valuation of any adjustment in the *Contract Price*, subject to any different or additional requirements contained in the *Specifications*, the following shall apply:

- .1 If applicable, unit prices included in the *Contract*, or prices pro rata thereto, will be used to value changes;
- .2 Proposed methods of adjustment should contain itemized breakdowns describing the net actual value of the *Work* (excluding *Value Added Taxes*), the *Contractor's* mark-up for overhead and profit, the mark-up for overhead and profit of *Subcontractors*, and where appropriate, detailed quotations or cost vouchers from *Subcontractor* and *Suppliers*;
- .3 All overhead costs are deemed to include both site and head office overhead costs, as well as any applicable insurance and bonding costs;
4. 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 WSIB, Employment Insurance, Canada Pension, vacation pay, and hospitalization and medical insurance;
- .5 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, the *Contractor's* mark-up for overhead and profit only will be applied to the net value of the change.

6.1.4 The *Owner*, through the *Consultant*, reserves the right to authorize payment for a change in the *Work* by means of *Cash Allowance*. For greater certainty, the *Contractor* is not entitled to any mark-up for overhead and profit on such amounts.

6.1.5 In the event that any change to the *Work* results in a reduction in the *Contract Price*, the *Contractor* shall not be entitled to claim for any lost revenue, lost profit or loss of anticipated profit related thereto.

6.1.6 Where *Work* is added to the *Contract*, the *Contractor* shall only be entitled to an increase in the *Contract Price* by the cost of performing the *Work* as agreed or in accordance with GC 6.3.7 as amended

including all applicable taxes, but excluding *Value Added Taxes*, plus the following, identified separately:

- .1 Contractor's mark-up on its own work:
  - .1 Overhead: 10%
  - .2 Profit: 5%
- .2 Contractor's mark-up on Subcontractor's work:
  - .1 Overhead: 5%
  - .2 Profit: 5%
- .3 Subcontractor's mark-up on its own work:
  - .1 Overhead: 10%
  - .2 Profit: 5%
- .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 6.2 CHANGE ORDER

- .1 Delete paragraph 6.2.1 insert new paragraph 6.2.1 as follows:

6.2.1 When a change in the *Work* is proposed or required, the *Consultant* shall provide a notice describing the proposed change in the *Work* to the *Contractor*. The *Contractor* shall provide the following:

- .1 Quotations from the *Subcontractors* on the *Subcontractor's* letterhead and with *Subcontractor's* signature.
- .2 Quotations from the *Subcontractors* and the *Contractor* shall have a complete breakdown for all items of material, a total number of hours for labour, and a dollar rate applied against individual material items and labour quantities.
- .3 Quotation shall stipulate any adjustment in the *Contract Time*, if any, for the proposed change in the *Work*.
- .4 Quotation shall indicate percentage values for overhead and profit by the *Contractor* and the *Subcontractors*.
- .5 Ensure all mathematical calculations are complete.
- .6 Quotations submitted with any of the above items missing or incorrect will be returned for revision.

## GC 6.3 CHANGE DIRECTIVE

- .1 Delete paragraph 6.3.7.1 (1), (2), (3) and (4) in their entirety and substitute new paragraph 6.3.7.1 (1) as follows:
  - "(1) carrying out the *Work*, including necessary supervisory services;"
- .2 Delete paragraphs 6.3.7.7, 6.3.7.12, 6.3.7.15 and 6.3.7.17.

## GC 6.4 CONCEALED OR UNKNOWN CONDITIONS

.1 Delete paragraph 6.4.1 insert new paragraph 6.4.1 as follows:

6.4.1 The *Contractor* shall immediately, and in no event, later than 2 Working Days after first observance, notify the *Consultant* and the *Owner* in writing, if in its opinion, the subsurface or otherwise concealed physical conditions at the *Place of the Work* which existed before the commencements of the *Work* differ materially from those indicated in the *Contract Documents* or a reasonable assumption of probable conditions based thereon.

Add new paragraph 6.4.5:

6.4.5 The *Contractor* confirms that, prior to bidding the *Project*, applying the standard of care described in paragraph 1.5.1, it carefully investigated the *Place of the Work*. Notwithstanding any other provision in the *Contract*, the *Contractor* is not entitled to compensation or to an extension of the *Contract Time* for conditions which could reasonably have been ascertained by the *Contractor* by such investigation undertaken prior to the submission of the bid.

## GC 6.5 DELAYS

.1 Add the following to the end of paragraph 6.5.1 and to the end of paragraph 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”.

.2 Add the following to paragraph 6.5.3: “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).”

.3 Add new paragraphs 6.5.6 and 6.5.7.

6.5.6 The *Contractor* shall at all times perform the services required to perform the *Work* in accordance with the *Contract Documents* as diligently and expeditiously and to maintain an orderly progress of the *Work*, and in accordance with the *Contract Time* and any revisions thereto. The *Contractor* shall at all times provide sufficient personnel to accomplish its services within the *Contract Time*.

6.5.7 If the *Contractor* is delayed in the performance of the *Work* by an act or omission of the *Contractor* or anyone employed or engaged by the *Contractor* directly or indirectly, or by any cause within the *Contractor’s* control, then the *Contractor* shall take appropriate steps, in accordance with paragraph 3.5.2, to recover any lost time, and the costs of such recovery efforts shall be to the *Contractor’s* account. To the extent that the *Contractor* caused delay results in the *Owner* incurring additional costs and expenses and/or a change in the *Contract Time*, the *Contractor* shall be liable to the *Owner* for the *Owner’s* cost and damages arising therefrom, including but not limited to, all services required by the *Owner* from the *Consultant* as

a result of such delay by the *Contractor* and, in particular, the cost of the *Consultant's* services during the period between the date of *Substantial Performance of the Work* stated in Article A-1 herein as the same may be extended through the provision of these General Conditions and any later, actual date of *Substantial Performance of the Work* achieved by the *Contractor*.

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

- .1 In paragraph 6.6.5, delete “claim” in the second line and replace with “necessary claim information”.
- .2 Add new paragraph 6.6.7:
  - 6.6.7. The *Owner* may make claims arising out of the costs incurred for additional services provided by the *Consultant* resulting from the *Contractor's* failure to perform the *Work* in accordance with the terms and conditions of the *Contract*, including the *Contractor's* issuance of unnecessary requests for information. The *Consultant* will notify the *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. The *Owner* shall make claims against the *Contractor* based on the *Consultant's* invoices.

#### 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 Delete paragraph 7.1.5.2 and insert new paragraph 7.1.5.2 as follows:
  - 7.1.5.2 withhold further payment to the *Contractor* until the *Owner* has completed all *Work* required by the *Contract Documents* and satisfied any of its costs or damages resulting from the *Contractor's* default; and

#### GC 7.2 CONTRACTOR'S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT

- .1 Delete subparagraph 7.2.3.1 in its entirety.
- .2 Delete subparagraph 7.2.3.3 in its entirety and substitute new subparagraph 7.2.3.3:
  - 7.2.3.3 the *Owner* fails to pay the *Contractor* when due the amount certified by the *Consultant* or awarded by arbitration or a Court, except where the *Owner* has a bona fide claim for set off, or
- .3 Delete from line 2 of subparagraph 7.2.3.4, the words, “OF THE OWNER”.
- .4 Amend paragraph 7.2.4 by deleting “5” and substitute “15”.
- .5 Amend paragraph 7.2.5 by deleting the words “reasonable profile” in line 2 and deleting the word “damages” in line 3 and substitute the words “direct damages”, and by deleting the period at the end of the paragraph and replacing it with a comma and then adding the following words: “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”.
- .6 Add the following new paragraph 7.2.6:

- 7.2.6 The Owner's withholding of progress payments, holdback payment and/or final payments pursuant to GC 5.8 shall not constitute a default under GC7.2.3 permitting the Contractor to stop the Work or terminate the Contract.

## GC 8.1 AUTHORITY OF THE CONSULTANT

- .1 Delete 8.1.1, 8.1.2 and 8.1.3, and insert the following new paragraphs:
- 8.1.1 Differences between the parties to the *Contract* as to the interpretation, application or administration of this *Contract* or any failure to agree where agreement between the parties is called for, herein collectively called disputes, which are not resolved in the first instance by finding of the *Consultant* pursuant to the provisions of GC 2.2 ROLE OF THE CONSULTANT, paragraphs 2.2.7 and 2.2.8 shall be settled in accordance with the requirements of this General Condition.
- 8.1.2 The claimant shall give written notice of such dispute to the other party no later than 7 days after the receipt of the *Consultant's* finding given under GC 2.2 - ROLE OF THE CONSULTANT, paragraphs 2.2.7 or 2.2.8. Such notice 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 7 days to such notice after he receives or is considered to have received it, setting out in such reply his grounds and relevant provisions of the *Contract Documents*.
- 8.1.3 If the matter in dispute is not resolved promptly the *Consultant* will give such instructions as in its 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*, the *Owner* shall pay the *Contractor* verifiable costs incurred by the *Contractor* in carrying out such instructions which the *Contractor* was required to do beyond what the *Contract Documents* correctly understood and interpreted would have required him to do including costs resulting from interruption of the *Work*.
- 8.1.4 It is agreed that no act by either party shall be construed as a renunciation or waiver of any of his rights or recourses, provided he has given the notices in accordance with paragraph 8.1.2 and has carried out the instructions as provided in paragraph 8.1.3.
- 8.1.5 If the parties have agreed to submit disputes to arbitration, then the dispute shall be submitted to arbitration in accordance with the provisions of the arbitration legislation of the *Place of the Work*.
- 8.1.6 If no agreement is made for arbitration, then either party may submit the dispute to such judicial tribunal as the circumstances may required.
- 8.1.7 In recognition of the obligation by the *Contractor* to perform the disputed work as provided in paragraph 8.1.3, it is agreed that settlement of dispute proceedings may be commenced immediately following the dispute in accordance with the foregoing settlement of dispute procedures.



## GC 8.2 NEGOTIATION, MEDIATION AND ARBITRATION

- .1 Delete 8.2 in its entirety.

## GC 8.3 RETENTION OF RIGHTS

- .1 Add new subparagraph 8.3.3:

8.3.3 If the Parties agree under paragraph 8.1.5 to have a dispute resolved by arbitration, the *Contractor* agrees that this paragraph 8.3.3 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 the *Contractor* be deprived of its right to enforce its lien against the *Project* should the *Owner* fail to satisfy any arbitral award. For greater certainty, nothing in this paragraph 8.3.3 shall prevent the *Contractor* from taking the steps required by the *Construction Act* to preserve and/or perfect a lien to which it may be entitled.

## GC 9.1 PROTECTION OF WORK AND PROPERTY

- .1 Delete subparagraph 9.1.1.1 in its entirety and substitute new subparagraph 9.1.1.1:

9.1.1.1 errors in the *Contract Documents* which the *Contractor* could not have discovered applying the standard of care described in paragraph 1.5.1;

- .2 Delete paragraph 9.1.2 in its entirety and substitute the following new paragraph 9.1.2:

9.1.2 Before commencing any *Work*, the *Contractor* shall determine the locations of all underground utilities and structures indicated in or reasonably determinable from the *Contract Documents* or that are discoverable by applying to an inspection of the *Place of the Work* the degree of care and skill described in paragraph 1.5.1.

- .3 Add new paragraph 9.1.5:

9.1.5 The *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 the *Contractor*, without first consulting the *Owner* and receiving written instructions as to the course of action to be followed from either the *Owner* or the *Consultant*. However, where there is danger to life or public safety, the *Contractor* shall take such emergency action as it deems necessary to remove the danger.

## GC 9.2 TOXIC AND HAZARDOUS SUBSTANCES

- .1 Add to new paragraph 9.2.5 (5) as follows:

(5) comply with the *Owner's* requirements and specifications for *Hazardous Substances* contained in the *Contract Documents*.

- .2 Add to paragraph 9.2.6 after the word "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 the *Contractor* or anyone for whom the *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 the *Owner* or others,"
3. In paragraph 9.2.7 after "is responsible" add  
"or that any toxic or *Hazardous Substances* or materials already at the *Place of the Work* prior to the *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 the *Contractor* or anyone for whom the *Contractor* is responsible in a manner which does not comply with legal and regulatory requirements,".
- .4 Add to paragraph 9.2.8 after the word "responsible", the following:  
"or that any toxic or *Hazardous Substances* or materials already at the *Place of the Work* prior to the *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 the *Contractor* or anyone for whom the *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 the *Owner* or others,"
- .5 Add "and the *Consultant*" after the word "Owner" in subparagraph 9.2.8.4.

## GC 9.4

### CONSTRUCTION SAFETY

- .1 Delete paragraph 9.4.1 in its entirety and substitute new paragraph 9.4.1
- 9.4.1 The *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 the *Owner's* Safety and Infection Control Regulations, Guidelines and Instructions for *Contractors*, a copy of which is found at Section 1 of the Specifications. The *Contractor* shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the *Work*. The *Contractor* hereby accepts the designation of "constructor" as defined under the *Occupational Health and Safety Act* for the *Project*, and responsibility for the obligations and liabilities associated therewith. Prior to the commencement of the *Work*, the *Contractor* shall submit to the *Owner* a copy of the Notice of Project filed with the Ministry of Labour in respect of the *Work*.

- .2 Add new paragraphs 9.4.3, 9.4.4, 9.4.5, 9.4.6 and 9.4.7:
- 9.4.2 Prior to the commencement of the *Work*, the *Contractor* shall submit to the *Owner*:
- .1 a current WSIB clearance certificate;
  - .2 copies of the *Contractor's* insurance policies having application to the *Project* or certificates of insurance, at the option of the *Owner*;
  - .3 documentation of the *Contractor's* in-house safety-related programs;
  - .4 a copy of the Notice of Project filed with the Ministry of Labour naming itself as “constructor” under *OHSA*.
- 9.4.3 The *Contractor* hereby represents and warrants to the *Owner* that appropriate health and safety instruction and training have been provided and will be provided to the *Contractor's* employees and *Subcontractors, Suppliers* and any one for whom the *Contractor* is responsible, before the *Work* is commenced and agrees to provide to the *Owner*, if requested, proof of such instruction and training.
- 9.4.4 The *Contractor* shall tour the appropriate area to familiarize itself with the job site prior to commencement of the *Work*.
- 9.4.5 The *Contractor* shall never work in a manner that may endanger anyone.
- 9.4.6 The *Contractor* shall indemnify and save harmless the *Owner*, the *Consultant* and their respective agents, officers, directors, employees, consultants, successors and assigns from and against the consequences of any and all safety infractions committed by the *Contractor* under *OHSA*, including the payment of legal fees and disbursements on a solicitor and client basis. Such indemnity shall apply to the extent to which the *Owner* is not covered by insurance, provided that the indemnity contained in this paragraph shall be limited to costs and damages resulting directly from such infractions and shall not extend to any consequential, indirect or special damages.
- 9.4.7 In the event that the *Owner* engages other contractors at the *Place of the Work* or performs work with its own forces,, the *Owner* undertakes to include in its contracts with other contractors and/or in its instructions to its own forces the requirement that the other *Contractor* or own forces, as the case may be, must comply with directions and instructions from the *Contractor* as “constructor” with respect to occupational health and safety and related matters.

## GC 9.5

### MOULD

- .1 Add “and the *Consultant*” after the word “*Owner*” in subparagraph 9.5.2.4.
- .2 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 the *Consultant* may recommend in consultation with the *Contractor*. If, in the opinion of the *Consultant*, the *Contractor* has been delayed in performing the *Work* and / or has incurred additional costs under paragraph 9.5.1.2, the *Owner* shall reimburse the *Contractor* for its reasonable costs incurred as a result of the delay as certified by the *Consultant*, and

## GC 10.1 TAXES AND DUTIES

.1 Add new paragraph 10.1.3:

10.1.3 The *Owner* shall be entitled to all available refunds or rebates of all taxes and custom duties applicable to the *Contract*, and the *Contractor* shall cooperate with the *Owner* in ascertaining the amount of such tax and custom duties and if necessary claim on its own behalf and transfer to the *Owner* or facilitate a direct claim by the *Owner* for any such available refund or rebate.

## GC 10.2 LAWS, NOTICES, PERMITS, AND FEES

.1 Add to the end of paragraph 10.2.4, the following words:

“The *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. The *Contractor* shall be present at each site inspection by an inspector or registered code agency as applicable under the Ontario Building Code.”

.2 Delete from the first line of paragraph 10.2.5 the word, “The” and substitute the words “Subject to paragraphs 3.4.1 and 3.10.7, the”.

## GC 11.1 INSURANCE

.1 Delete from the first and second lines of paragraph 1 of CCDC 41 - CCDC INSURANCE REQUIREMENTS related to General Liability insurance the reference to “\$5,000,000” and substitute “\$10,000,000”.

.2 Delete from the second line of paragraph 2 of CCDC 41 - CCDC INSURANCE REQUIREMENTS related to Automobile Liability insurance the reference to “\$5,000,000” and substitute “\$10,000,000”.

.3 Delete from the third and fourth lines of paragraph 3 of CCDC 41 - CCDC INSURANCE REQUIREMENTS related to Aircraft and Watercraft Liability insurance the reference to “\$5,000,000” and substitute “\$10,000,000”.

## GC 12.1 INDEMNIFICATION

.1 Delete paragraph 12.1.1 in its entirety and substitute the following:

“12.1.1 The *Contractor* shall indemnify and hold harmless the *Owner*, the *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, the *Contractor’s* performance of the *Work* or anyone for whose acts the *Contractor* may be liable including *Subcontractor* and, *Suppliers*.

- .2 Delete paragraph 12.1.2 in its entirety and substitute the following:

12.1.2 “The *Owner* shall indemnify and hold harmless the *Contractor*, the *Contractor’s* agents and employees from and against claims, demands, losses, costs, damages, actions, suits, or proceedings arising out of the *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*.”

- .3 Delete paragraph 12.1.5 in its entirety

## GC 12.2 WAIVER OF CLAIMS

- .1 Delete paragraphs 12.2.3, 12.2.4, 12.2.5 and 12.2.10.

## GC 12.3 WARRANTY

- .1 Delete from the first line of paragraph 12.3.2 the word, “The” and substitute the words “Subject to paragraph 3.4.1, the...”

- .2 Insert new paragraph 12.3.9 as follows:

12.3.9 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 the *Consultant*.”

## Add new PART 13 as follows:

### PART 13 OTHER PROVISIONS

#### GC 13.1 OWNERSHIP OF MATERIALS

- 13.1.1 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 the *Owner*. All *Work* and *Products* delivered to the *Place of the Work* by the *Contractor* shall be the property of the *Owner*. The *Contractor* shall remove all surplus or rejected materials as its property when notified in writing to do so by the *Consultant*.

#### GC 13.2 CONSTRUCTION LIENS

- 13.2.1 In the event that a construction lien is registered against the *Project* by or through a *Subcontractor* or *Supplier*, the *Contractor* shall, at its own expense:
- .1 within seven (7) *Working Days*, ensure that any and all construction liens and certificates of action are discharged, released or vacated by the posting of security; and
- .2 in the case of written notices of lien, ensure that such notices are withdrawn, in writing.

13.2.2 In the event that the *Contractor* fails to conform with the requirements of 13.2.1, the *Owner* may vacate or discharge the lien and then set off and deduct from any amount owing to the *Contractor*, all amounts posted as security or paid to the lien claimant and associated expenses, including the costs of borrowing the appropriate cash, letter of credit or bond as security and legal fees and disbursements. If there is no amount owing by the *Owner* to the *Contractor*, then the *Contractor* shall reimburse the *Owner* for all of the said costs and associated expenses.”

### **GC 13.3 CONTRACTOR DISCHARGE OF LIABILITIES**

13.3.1 In addition to the obligations assumed by the *Contractor* pursuant to GC 3.7, the *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.

### **GC 13.4 DAILY REPORTS/DAILY LOGS**

13.5.1 The *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 the *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.

13.5.2 The *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 the *Contractor* in connection with GC 3.5, and comparing that resourcing to the resourcing anticipated when the most recent version of the schedule was prepared pursuant to GC 3.5.

### **GC 13.5 HOSPITAL RELATED PROVISIONS**

13.6.1 The *Contractor* recognizes and understands that the *Owner* is a hospital approved under the *Public Hospitals Act* (Ontario) and is therefore subject to a highly regulated legal and operational environment. Without limiting the generality of any other provision in the Contract, the *Contractor* shall provide reasonable co-operation and assistance to the *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*).

13.6.2 The *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 the *Contractor* or the *SubContractors* is determined by the *Owner* to be a concern for the security or safety of such patients, employees or occupants, the *Owner* may require that the *Contractor* replace such employee.

13.6.3 The *Contractor* recognizes that part of the *Work* may consist 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 the *Owner*. The *Contractor* shall comply with the reasonable instructions provided by the *Owner*

(including, without limitation, the *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 the *Contractor* in complying with the said instructions shall be part of the *Contract Price*.

- 13.6.4 Notwithstanding any other provision in the *Contract*, paramountcy of access must be given to emergency vehicles and no claim may be made by the *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 the *Owner* will use commercially reasonable efforts to avoid and to limit the duration of any temporary lack of access for this reason.
- 13.6.5 The *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. The *Contractor* shall abide by the *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 the *Contractor*, *Subcontractors* or *Suppliers*.
- 13.6.6 The *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 the *Owner* from time to time, provided that a material amendment to the hospital policies and procedures by the *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.

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## PART 1 – GENERAL

### 1.1 GENERAL REQUIREMENTS

- .1 Read and be governed by conditions of the *Contract* and sections of Division 1.

### 1.2 SPECIFICATION FORMAT

- .1 These *Specifications* are not intended as a detailed description of installation methods but serve to indicate particular requirements in the completed work.
- .2 Where words in the *Contract Documents* occur in the singular number, they shall be taken as plural where applicable in accordance with the quantities required to satisfy the requirements of the *Contract*.
- .3 In the trade Sections of the *Specification*, unless the word "only" suffixes the words "supply" or "install" or other variations of those words, it is the express intent of this *Contract* that "supply and install" is implied. Words such as "provide" or "work includes" shall also mean "supply and install".
- .4 Wherever the words "approved", "satisfactory", "selected", "directed", "required", "submit", or similar words or phrases are used in the *Contract Documents*, it shall be understood that they mean, unless the text specifies otherwise, "approved by *Consultant*", "satisfactory to *Consultant*", "selected by *Consultant*", "directed by *Consultant*", "required by *Consultant*", "submit to *Consultant*".
- .5 Omission of words "a" and "the" throughout these *Specifications* is intentional and is done to keep instructions and directions clear and concise. Use of these words is implied and shall be read throughout as if written in full.

### 1.3 LAWS, NOTICES, PERMITS AND FEES

- .1 The building code - Ontario Regulation 332/12, including amendments, shall govern the *Work*.
- .2 Comply with codes, by-laws, and regulations of authorities having jurisdiction over the *Place of the Work*. Codes and regulations form an integral part of the *Contract Documents*.
- .3 *Owner* shall apply and pay for the building permit. The *Contractor* shall pick up building permit from the municipal department having jurisdiction at the *Place of the Work*. Obtain and pay for all other permits, licenses, deposits and certificates of inspection as part of the *Work*.
  - .1 *Contractor* is to pay for and obtain from the City of Toronto at the time of occupancy a formal City of Toronto issued Occupancy Certificate. Once the certificate has been obtained the *Contractor* is to turn it over to the *Owner*.
- .4 Arrange for inspection, testing and acceptance of the *Work* required by the authorities having jurisdiction. Be responsible for necessary preparations, provisions and pay costs.
- .5 Obtain permits required to execute work on municipal rights of way. Obtain damage deposits for sidewalks, roads and services, unless otherwise indicated.
- .6 It is the responsibility of the *Contractor* to schedule notifications and inspections required by authorities having jurisdiction such that notifications can be properly received and that inspections can be properly undertaken without causing a delay in the *Work*. The *Contractor*, at no additional cost to the *Owner*, shall be solely responsible for any delay in the *Work* caused by failure to properly schedule required notifications and inspections.



- .7 The *Contractor* shall provide to the chief building official or the registered code agency, where a registered code agency is appointed under the Ontario Building Code Act in respect of the construction to which the notice relates, the required notices set out in Division C – Part 1 Sentence 1.3.5.1(2) and Sentence 1.3.5.2 of the Ontario Building Code, O. Reg. 332/12 as amended. The *Contractor* shall be present at each site inspection by an inspector or registered code agency as applicable under Division C – Part 1 Sentence 1.3.5.2 of the building code.
  - .1 It is the responsibility of the *Contractor* to schedule notifications to the chief building official or the registered code agency such that the inspection pertaining to the notifications can be made within the time frame as required under Division C – Part 1 Sentence 1.3.5.3 of the Ontario Building Code, O. Reg. 332/12 as amended, without causing a delay in the *Work*. The *Contractor*, at no additional cost to the *Owner*, shall be solely responsible for any delay in the *Work* caused by failure to properly schedule required notifications and inspections.

#### 1.4 COORDINATION AND COOPERATION

- .1 The *Contractor* shall coordinate the work of various *Subcontractors* and other contractors to assure the best arrangement of pipes, conduits, ducts, equipment and other items in the available space. Under no circumstances will any claim for extra cost be allowed due to the failure by the *Contractor* to coordinate work. Prepare interference or installation drawings in accordance with Section 01 33 00, showing the work of various *Subcontractors* and submit drawings to *Consultant* for approval before commencing work.
- .2 The *Contractor* and all *Subcontractors* shall cooperate with and coordinate their work with each other and with other contractors in proper sequence and as required for the satisfactory and expeditious completion of the *Work*. Take field dimensions relative to this work. Fabricate and erect work to suit field dimensions and field conditions. *Provide* all forms, templates, anchors, sleeves, inserts and accessories required to be fixed to or inserted in the work and set in place or instruct the related *Subcontractors* as to their location. Pay the cost of extra work caused by and make up time lost as the result of failure to provide the necessary cooperation, information or items to be fixed to or built in, in adequate time.
- .3 Check all dimensions at the *Place of the Work* before commencing fabrication and installation and report all discrepancies, in writing, to the *Consultant*. Where dimensions are not available before work is commenced, the dimensions required shall be agreed upon by the various *Subcontractors* concerned and approved by the *Consultant*.
- .4 If the *Work* is presented in the *Contract Documents* in such a manner so as to make it impossible to produce first class work, or should discrepancies appear among the *Contract Documents*, the *Contractor* and *Subcontractors* shall request written interpretation before proceeding with the work. If the *Contractor* and *Subcontractors* fail to make such request, no excuse will thereafter be entertained for failure to carry out the work in a satisfactory manner.
- .5 System furniture as identified in the *Contract Documents* shall be supplied and installed by the *Owner's* designated supplier. The *Contractor* will be provided with *Shop Drawings* to assist with coordination. Coordinate storage at the *Place of the Work*, installation, and protection of the Systems Furniture.
- .6 *Contractor* shall provide double shifts and weekend work if required, to meet required schedule and short deadline. Coordinate with *Owner* if such need arises.
- .7 Coordinate delivery of hoisting equipment and cranes with *Owner* to limit disruptions to the site.
- .8 The *Owner* and *Consultant* will not recognize nor participate in any electronic project management program.
- .9 Operation limitations:
  - .1 The existing building will remain in full use and occupancy throughout the *Work*, except for such parts of the building that have been vacated for the *Work*.

- .2 Contractor's use of the *Place of the Work* is limited to permit regular use of existing Owner's facilities and to continue with the least amount of interference and disruptions possible.
  - .3 A hospital working day is from 8:00 a.m. to 5:00 p.m. everyday of the week. No work shall be performed outside of these hours unless otherwise coordinated and approved in writing by the Owner, or shutdowns affecting areas outside of the construction zone. Refer to item 1.27 in this section for requirements related to shut downs.
  - .4 Work that are excessively noisy that cannot be avoided and cannot be done off-site to take place on weekends from 9:00am to 7:00pm. Obtain approval in writing from Owner and include in 6-week detailed look-ahead.
  - .5 Limit noise levels in accordance with requirements of the Owner.
  - .6 Loading dock or such designated area by the Owner can only be used between the hours of 11:00 a.m and 3:00 p.m daily, Monday to Friday, unless otherwise coordinated and approved in writing by the Owner.
  - .7 Work will only be permitted to be performed under the direct full-time supervision of the Contractors superintendent. If Work progresses without the superintendent the work will be stopped.
- .10 General contractor shall coordinate with any 3<sup>rd</sup> party commissioning agents.

## 1.5 EXAMINATION

- .1 The Owner will not entertain any claim for extra work and/or expense incurred by the Contractor or its Subcontractors resulting from failure to examine existing construction, conditions, and previous work done either under this Contract or other separate contracts and conditions upon which any work depends for its satisfactory execution. All unsatisfactory conditions, defects and deficiencies shall be reported, in writing, to the Consultant, and shall have been corrected before proceeding with the Work.
- .2 Commencement of work shall imply acceptance of surfaces, previous work and conditions.

## 1.6 DISCREPANCIES AND CLARIFICATIONS

- .1 Prepare Interference Drawings after demolition and prior to commencement of construction in accordance with Section 01 33 00.
- .2 Advise Consultant of discrepancies discovered in requirements of the Contract Documents and request clarification in written form as early as possible.
- .3 Advise Consultant when clarifications are required pertaining to meaning or intent of requirements of Contract Documents and request clarification from Consultant in written form.
- .4 Do not proceed with related work until written clarification is provided by Consultant.
- .5 Failure to notify Consultant shall result in Contractor incurring responsibility for resulting deficiencies and expense at no additional cost to the Owner.
- .6 Written instructions issued by Consultant for the purpose of clarification, implicitly supersede applicable and relevant aspects of the Contract Documents irrespective of whether or not these documents are explicitly or specifically cited in clarification requests or clarification instructions.

## 1.7 CONTRACTOR'S USE OF SITE

- .1 Owner will designate working areas sufficient for the work of this Project. Confine all operations to designated areas.
- .2 Do not unreasonably encumber the *Place of the Work* with materials or equipment.

- .3 Move stored products or equipment which interferes with operations of *Owner* and other *Contractors*.
- .4 Obtain and pay for use of additional storage or work areas required for construction operations.
- .5 *Contractor* will control the designated areas. Storage at the *Place of the Work* within designated areas, if available, or other space will be allocated by the *Contractor*. Relocate stored equipment and materials which interfere with construction operations, as directed by the *Contractor*.
- .6 When *Contractor* requires access to the completed areas, permission shall be obtained from the *Owner* for such access, and work shall be performed only at times approved by the *Owner* which may require work outside of regular working hours or *Working Days*. *Contractor* shall be responsible to coordinate the work of the *Subcontractors* included and include in their *Contract Price* all costs for expenses, overhead, profit and applicable taxes related to performing such work during regular time or after hours and weekends, as instructed by the *Owner*.
- .7 *Contractor* shall ensure that measures are implemented to protect the finished areas, and leave at the end of the work period affected surfaces and equipment clear and ready for use by the *Owner*. Such protective measures shall first be approved by the *Owner* and include, but are not limited to:
  - .1 Tarping or covering with plywood existing flooring
  - .2 Tarping of walls, furniture and equipment finishes
  - .3 Removal and reinstallation of existing furniture and equipment
- .8 Equipment and materials must be kept within the Area of Work. *Owner* has the right to stop work if any equipment and materials are found to be left outside of the Area of Work, and/or blocking staff and public access.
- .9 *Contractor's* disposal bin must be kept in the vicinity of the loading dock area as designated by the *Owner*. The loading dock is located on the basement level, on the east side of the K-Wing building. Depending on other demands of space in the loading dock area, the designated location may be as far as the street level. *Contractor's* bin to be a maximum of 8' W x 10' D.

## 1.8 CODES AND STANDARDS

- .1 Codes and standards and installation, application and maintenance instructions referenced in the *Contract Documents* shall be the latest published editions, including amendments, at date of submission of bid that led to the formation of the *Contract*, unless specifically indicated otherwise.
- .2 Where the requirements of the *Contract Documents* exceed code or standard requirements, such additional requirements shall govern.
- .3 Where codes or standards or the *Contract Documents* do not provide all information necessary for complete installation of an item, then strictly comply with the manufacturer's instructions for first quality workmanship. In cases of discrepancies consult the *Consultant* for clarification.
- .4 In the event of conflict between any provisions of relevant codes and standards, the requirement of authority having jurisdiction shall apply.

## 1.9 HANDLING AND DELIVERY AND STORAGE

- .1 Handle and deliver and store *Products*, materials and equipment in accordance with manufacturers' and *Suppliers'* recommendations and in such a manner that no damage will be done to the *Products*, materials, equipment, the *Work* and the environment.

- .2 The Owner will designate limited storage areas at the site. Store *Products*, materials and equipment so as to ensure the preservation of their quality and fitness for the work. Store *Products*, materials and equipment on wooden platforms or other hard, clean surfaces raised above the ground or in watertight storage sheds of sufficient size for the storage of all materials and equipment which might be damaged by storage in the open. Locate stored *Products*, materials and equipment so as to facilitate prompt inspection. Do not use private property for storage purposes without the written permission of the property Owner.
- .3 Deliver and store packaged *Products*, materials and equipment undamaged, in their original wrappings or containers, with manufacturers' labels and seals intact.
- .4 Keep *Products*, materials and equipment free from debris, ice, snow and other foreign matter.
- .5 Store paints, coatings, thinners, solvents and other volatile materials in ventilated and lockable separate shed containing no other materials.
- .6 Carefully organize prior delivery of materials to the *Place of the Work* to permit continual progress of the *Work* without delay.
- .7 Immediately remove rejected materials and equipment from the *Place of the Work*.
- .8 If permitted, touch-up damaged factory finished surfaces to *Consultant's* satisfaction. Use primer or enamel to match original. Do not paint over name plates.
- .9 All material and equipment must be accommodated within the boundaries of each phase.

#### 1.10 ADDITIONAL DRAWINGS

- .1 Owner may furnish additional *Drawings* to assist proper execution of work. These *Drawings* will be issued for clarification only. Such *Drawings* shall have same meaning and intent as if they were included with drawings referred to in Article A - 2 of the Agreement and will not change the *Contract Price*.

#### 1.11 WORKMANSHIP

- .1 The *Work* of each section shall be carried out safely, in accordance with the Apprenticeship and Trades Qualification Act and applicable regulations, by skilled and experienced workers employed by a firm having a record of satisfactory completion of similar work.
- .2 Workmanship shall be of highest quality in accordance with best standard practice for type of work specified, except where specified more precisely.

#### 1.12 DISPOSAL OF WASTES

- .1 Burying and burning of rubbish and waste materials at the *Place of the Work* is not permitted.
- .2 Disposal of waste or volatile materials, such as mineral spirits, oil, paint or paint thinner into waterways, storm or sanitary drains is prohibited.
- .3 Comply with all environmental legislation which is applicable.
- .4 Arrange for removal of debris from the site daily or as otherwise directed by the Owner. Approval is required prior to construction start.
- .5 Access to the *Place of the Project* through the building for removal of debris, delivery of *Products*, and workers will be controlled as directed by the Owner.
- .6 Transport construction waste along designated path of travel, in covered and sealed carts so that dust, dirt, and other contaminants can be contained within the cart during transport. Wipe down the exterior of cart before leaving the hoarded construction area.

### 1.13 POLLUTION CONTROL

- .1 Wherever possible, cover or wet down dry materials to prevent blowing dust and debris.
- .2 *Provide* all means necessary to ensure dust control during all demolition work and during any excessive dust producing work during work of this *Project*.
- .3 Implement the dust control program specified in Sections 01 50 00 and 01 35 33 and as approved by the Medical Officer of Health for the City Toronto throughout the construction of this *Project*.
- .4 Comply with all environmental legislation which is applicable.

### 1.14 LOCATION OF EQUIPMENT AND FIXTURES

- .1 *Contract Documents* are, in part, diagrammatic and are intended to convey the scope of the *Work* and indicate general and approximate location, arrangement and sizes of fixtures and equipment. Obtain more accurate information about locations, arrangements and sizes from study and coordination of shop drawings and *Contract Documents*, and visits to the *Place of the Work*, and become familiar with conditions and spaces affecting these matters before proceeding with work.
- .2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.
- .3 Obtain manufacturer's literature for roughing-in and hook-up of equipment, fixtures and appliances.
- .4 Inform *Consultant* of impending installation and obtain his approval for actual location. Where job conditions require reasonable changes in indicated locations and arrangements, consult the *Consultant* to verify the actual locations and arrangements and make changes at no additional cost.
- .5 Submit field drawings to indicate relative position of various services and equipment when required by *Consultant*.

### 1.15 CONCEALMENT

- .1 Conceal pipes, ducts, tubing, wiring, and metal backing, in floor, wall and ceiling construction of finished areas wherever possible. If any doubt arises as to means of concealment, or the intention of *Contract Documents* in this regard, request clarification from *Consultant* before proceeding with the portion of work in question.
- .2 Make arrangements to have mechanical and electrical work laid out well in advance of concrete placement and furring installation so that provisions may be made for proper concealment. All such work shall be tested, inspected, pipe and duct covering applied where applicable, and approved before being concealed.

### 1.16 PROTECTION OF PROPERTY - GENERAL

- .1 Refer also to General Condition GC9.1, as amended by Document 00 73 00, and Section 01 51 16 Fire Safety Precautions During Construction.
- .2 The use of de-icing salts on any concrete surface will not be permitted.
- .3 Adequately protect concrete slabs and finished flooring from damage. Take special measures when moving heavy loads or equipment on them.
- .4 Keep floors and walls free of oil, grease and other materials likely to discolour them and/or affect bond of applied finishes.

- .5 Each *Subcontractor* shall protect the work of other *Subcontractors* from damage during the execution of their work. Damaged work shall be repaired or replaced by appropriate *Subcontractor*, but at the expense of those causing damage.
- .6 Provide protection required to enable existing building, equipment, services and utilities to remain in continuous and normal operation, and to maintain Construction Schedule.
- .7 Indemnify the *Owner* from and against all claims and losses resulting from the above operations.
- .8 Protect loading dock prior to use.

#### 1.17 PROTECTION OF EXISTING UTILITIES AND SERVICES

- .1 Where work involves breaking into or connecting to existing utilities and services, carry out work at times directed by *Consultant* and governing authorities, with minimum of disturbance to pedestrian and vehicular traffic.
- .2 Before commencing work, and during work, establish location and extent of existing utilities and service lines at the *Place of the Work* and notify *Consultant* of findings.
- .3 Provide adequate bridging over trenches which cross sidewalks or roads to permit normal traffic.
- .4 Remove abandoned utilities and service lines.
- .5 Record locations of maintained, re-routed and abandoned utilities and service lines.
- .6 Indemnify the *Owner* from and against all claims and losses resulting from the above operations.

#### 1.18 NOISE PROTECTION

- .1 Provide full cooperation and protective measures in minimizing all excessive noise due to construction operations.
- .2 No pneumatic tools and other excessively noisy and disrupting tools, machinery and equipment will be permitted without written approval of the *Owner*.
- .3 Elect methods, applications and equipment which generate the least amount of noise possible to perform the work.
- .4 If cutting or other work that generates excessive noise cannot be avoided, the *Contractor* should complete that portion of the work outside of the *Owner's* property, following by-laws and regulations, as implied in the contract and per applicable government agency and Authorities Having Jurisdiction.
- .5 *Owner* has the right to stop work due to excessive noise. Any damages and delays resulting from such shut-downs are the responsibility of the *Contractor*.
- .6 Where required, the *Contractor* shall ensure that workers wear noise protection.

#### 1.19 EMPLOYEE CONTROL

- .1 Workers are permitted into existing buildings only where their work is affected.
- .2 All entrances to existing buildings from new additions, whether through existing doors or through doors in temporary partitions, shall be kept locked. Submit duplicate keys for locks to *Consultant*.
- .3 *Owner* will provide identification badges to *Contractor* for all *Subcontractor* employees at the *Contractors* expense, at \$25.00 charge per unit, who must wear them attached to their clothing in a conspicuous location throughout the duration of this project when at the *Place of the Work*. If damaged or lost and not returned to *Owner*, a nominal charge of \$25.00 per damaged or lost badge will be assessed against the *Contractor*. *Contractor* shall obtain the badges from the office of the Sunnybrook Coordinator for Fire & Security Services at local 5991.

- .4 *Contractor, Subcontractors, Suppliers, and anyone employed either directly or indirectly by them, will not be permitted to use Owner's cafeteria and washroom facilities during work of this Contract. Consuming of food and beverages will be restricted to the Place of the Work.*

## 1.20 TRADEMARKS AND LABELS

- .1 Trademarks and labels, including applied labels, shall not be visible in the finished work. Where such trademarks and labels are visible, remove them by grinding, if necessary; or paint them out where the particular surface is being painted; or if on plated parts replace them with new plain plated or non-ferrous metal parts.
- .2 Trademarks and labels which are essential to identify mechanical, fire protection, automatic sprinklers and electrical equipment for maintenance and replacement purposes shall be left intact.

## 1.21 FASTENINGS

- .1 *Provide all fastenings, anchors and accessories and adhesives required for fabrication and erection of the Work.*
- .2 Exposed metal fastenings and accessories shall be of same texture, colour and finish as base metal on which they occur.
- .3 Metal fastenings shall be of the same material as the metal component they are anchoring or of a metal that will not set up an electrolytic action that could cause damage to the fastening or metal component. In general, anchors occurring on or in concrete and masonry shall be non-corrosive.
- .4 Unless fasteners and metal components which are being fastened are of the same material, washers between fasteners and metal components shall be neoprene or nylon.
- .5 Anchoring and fastening devices or adhesive shall be of appropriate type and shall be used in sufficient quantity and in such a manner as to provide safe, positive and permanent anchorage of the unit to be anchored in position. Install anchors at spacing to provide for required load carrying capacity. Provide manufacturer's written confirmation that adhesive is compatible with all materials with which it will come into contact.
- .6 Keep exposed fastenings to a minimum, evenly spaced and neatly laid out.
- .7 Supply adequate instructions and templates and, if necessary, supervise installation where fastenings or accessories are required to be built into work of other *Subcontractors*.
- .8 Fastenings shall be of permanent type. Wood plugs not permitted.
- .9 Fastenings which cause spalling or cracking of material to which anchorage is being made are not permitted.
- .10 Except where specified, do not use powder actuated fastening devices on any part of this work without written acceptance of *Consultant*. Take particularly stringent safety precautions when permitted to use powder actuated fastenings.

## 1.22 RENOVATIONS, ALTERATIONS AND REPAIRS TO EXISTING BUILDING

- .1 Refer also to Section 01 50 00 Temporary Facilities, Section 01 51 16 Fire Safety Precautions During Construction, Section 01 35 33 Infection Control During Construction, Section 01 35 26 Safety Requirements and Drawings for Demolition requirements.

- .2 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*. Existing building to remain functional. *Contractor* shall, when required on occasion, expedite work outside of *Contractor's* normal working hours. *Owner* will cooperate to keep such overtime hours to a minimum.
- .3 Where new work connects with existing building and where existing work is altered, do all necessary cutting and fitting required to make satisfactory connections with existing work so as to leave entire *Work* in a finished and acceptable condition.
- .4 Execute work with least possible interference and disturbance to occupants, public and normal use of premises. Arrange with *Consultant* to facilitate execution of work.
- .5 Where security has been reduced by work of the *Contract*, provide temporary means to maintain security. Hoarding, security personnel, for duration required by work, to approval of *Owner* and/or *Consultant*.
- .6 Make good all existing materials and finishes, which are not to be removed nor altered, but which are damaged or disturbed during the progress of the *Work* under this *Contract*.
- .7 Where existing work is to be made good, match the new work exactly to the old work in material, form, construction and finish, unless otherwise specified or approved.
- .8 Where locations outside of the construction area, including corridors, elevators and loading docks, are damaged during receiving, transportation, and disposal of material and waste, it is the responsibility of the *Contractor* to repair the damage expeditiously within 24 hours.
- .9 Drill existing work carefully, leaving a clean hole no larger than required.
- .10 Prior to removing any existing acoustical lay-in ceiling panels or tiles outside of Area of *Work*, notify *Owner's* Plant Operations Department at Local 4568.
- .11 Wherever it becomes necessary to cut or interfere in any manner with existing utilities, services and equipment for short periods of time, do the work at such times as approved by *Consultant* and governing authorities. Provide minimum ten (10) *Working Days'* written notice to *Owner* of all impending interruptions. Refer also to Section 01 51 16 Fire Safety Precautions During Construction.
- .12 Tag and mark electrical switches and valves used to isolate utility services as follows:
  - .1 Name of *Contractor* or *Subcontractor*
  - .2 Tradesman's name
  - .3 Date shut off
  - .4 Date and time to be turned back on
- .13 *Owner* will designate one elevator for *Contractor's* use for moving materials within the building. Use of the elevator may be restricted to certain hours of day only. Hospital services to have priority to elevator use. *Contractor* shall coordinate the transportation of materials and waste within these hours only. Protect walls of elevators with ½" thick plywood liner and protective elevator blanket covers, to be approved by Hospital prior to commencement of *WORK*. The liner shall be a free standing frame construction. Do not transport materials on the elevator with an aggregate weight greater than the elevator's design capacity. Fabricate and order materials and equipment to suit elevator delivery/transport. Accept liability for damage, safety of equipment and overloading of existing equipment. Elevator will be shared between food services and other hospital services, and must be wiped down and cleaned after each use to avoid contamination of food products served to patients.
- .14 Provide temporary barriers and warning signs in locations where renovation and alteration work is adjacent to areas used by the public, workers and *Owner's* personnel.



- .15 In all existing rooms which are affected by work of this *Contract*, the *Contractor* shall engage Owner's approved moving company to remove existing furniture, equipment and other items to be retained by Owner. Owner will direct Contractor for timing and where items are to be moved, Contractor will coordinate with mover. Cost will be covered by a Cash Allowance identified in to Section 01 21 00 Allowances.
  - .1 Owner approved moving company: Consolidated Moving 416-922-9595 (as of Feb 28, 2020)
- .16 Where Scanning/Radar and/or core drilling may be required, provide written notice to *Consultant* and Owner minimum five (5) business days prior to doing such work. Submit core drilling drawings showing locations for Consultant's approval. Indicate locations of openings in relation to column grid lines and permanent walls. Scanning/Radar and/or core drilling shall be at Contractor's expense.
- .17 Work within restricted and confined spaces shall be undertaken in strict compliance with Provincial regulations. Refer to the Regulations for Health Care and Residential Facilities.
- .18 Patients, visitors and employees of Owner shall not be exposed to environmental, health or safety risks caused by the actions of Contractors engaged to work at Owner.
- .19 Employees of Contractors engaged to do work at *Place of the Work* shall not be exposed unnecessarily to environmental, health or safety risks due to their employers' failure to comply with Federal or Provincial Acts and Regulations which specify environmental, health and safety requirements.
- .20 Ensure that the workers work safely, and wear or use the appropriate protective clothing, equipment and devices.
- .21 All permanent and temporary penetrations of the existing building envelope and interior assemblies must be installed, sealed and finished so that the affected assembly will have same or better air tightness, acoustic separation and structural strength.
- .22 All permanent and temporary penetrations of fire-rated assemblies must be installed, sealed and finished so that the continuous fire separation of affected assembly is maintained.

### 1.23 MISSING PATIENT SEARCH

- .1 In the event that the Owner is required to do a "missing patient" search, the Contractor will be obliged to carry out a detailed search of the *Place of the Work*, under the direction of the Owner.

### 1.24 RESERVED

### 1.25 SECURITY

- .1 Due to existing collective agreements, contracted security groups are not permitted on Owner's property, except within the confines of the *Place of the Work*.

### 1.26 FIRE ALARM SYSTEM FALSE ALARMS

- .1 Contractors working anywhere in the Owner's plant and facilities are responsible for any costs incurred for false alarms caused by their work. The Owner's plant and facilities is fully protected with smoke detection equipment that will be activated by numerous construction procedures.
- .2 The Owner will, with written request of a minimum 5 working days in advance, arrange to put any fire alarm zone in bypass to permit construction.
- .3 Any Contractor working in the Owner's plant and facilities will be assessed \$1,500.00 fine per false alarm payable to the Owner by Certified Cheque. Any Contractor causing false alarms and not paying such costs will not be permitted to continue work until said cheque is received.

### 1.27 SHUT DOWNS

- .1 General contractor is to provide 6 weeks notice prior to any shut down inside and/or outside the area of construction, as indicated on the six-week detailed look-ahead.
- .2 General contractor is to provide 6 weeks notice for noisy, odorous and disruptive work, as indicated on the six-week detailed look-ahead. Such work will have to take place during the weekend, between hours 9:00am to 5:00pm.

### 1.28 ELECTRONIC FILES

- .1 In the event that the *Contractor*, a *Subcontractor*, or a *Supplier* requests AutoCAD files from the *Consultant*, the *Consultant* may at their discretion require a fee paid for preparing the electronic file of plans and require a copyright waiver to be signed. The fee required shall be:
  - .1 Architectural: \$750 per architectural set.

### 1.29 COVID-19

- .1 Contractor is responsible to ensure safe physical distancing and all other protocols are followed by all workers, subcontractors and suppliers while on Hospital property, in accordance with health authority guidelines and Hospital's Health and Safety rules.
- .2 Compliance to the above requirements should not form the basis for requesting extension in schedule and/or claims for extra.

END OF SECTION

## PART 1 – GENERAL

### 1.1 GENERAL REQUIREMENTS

- .1 Read and be governed by conditions of the *Contract* and sections of Division 1.

### 1.2 CASH ALLOWANCES

- .1 Refer to General Conditions, GC4.1 Cash Allowances, as amended by Document 00 73 00.  
.2 The *Contract Price* includes all costs for expenses, overhead and profit as required for the following cash allowances, with the exception of the *Value Added Taxes*:

.1	Inspection and Testing	\$20,000.00
.2	Miscellaneous Demolition (to suit unforeseen site conditions)	\$30,000.00
.3	Finish Hardware (Supply only)	\$25,000.00
.4	Fireproofing (supply and application of Fireproofing requirement for existing structural elements in which their existing non-compliant conditions are exposed during construction)	\$5,000.00
.5	Firestopping (Supply and application of miscellaneous Firestopping for existing non-compliant conditions exposed during construction)	\$5,000.00
.6	Art Curation Program	\$15,000.00
.7	Structured Cabling (refer to Electrical Specifications Section 27 10 00 Structured Cabling)	\$68,000.00
.8	Security Systems Cash Allowance (Refer to Electrical Specifications Section 28 05 00)	\$22,000.00
.9	Asbestos Abatement (Refer to scope indicated within Section 02 82 00 Asbestos Abatement)	\$100,000.00
.10	Inspection and Testing for Asbestos and other Hazardous Materials (Refer to scope indicated within Section 02 82 00 Asbestos Abatement)	\$75,000.00
.11	Mould Remediation (Unforeseen existing conditions exposed during demolition and construction)	\$100,000.00
.12	Security (Contractor to coordinate directly with SHSC security department)	\$24,000.00
.13	Moving (of Owner's properties as directed on site)	\$23,000.00
.14	Installation of Automatic Dispensing Units and associated wiring and cabling cost	\$35,000.00

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- .15 Ceiling access panels: Contractor to allow for supply and installation of three additional 24"x24" ceiling access panels for each of the following rooms, to suit existing access points for services concealed in the ceiling.
- .1 All patient bedrooms.
  - .2 Storage Room K1E03B
  - .3 Soiled Linen K1E32A
  - .4 Laundry Room K1E32B
  - .5 Quiet Room K1E03
- .16 Relocation of existing mechanical access point to avoid requiring access panels in millwork ceilings.
- (Refer to Mechanical drawings M-001 \$25,000.00)
- .3 Allowances listed above shall be carried and administered by Division 1 (and not by other Divisions), during the course of the Project.
- .4 Expenditures from above cash allowances may be made only upon receipt of order signed by *Consultant*.
- .5 *Contractor* shall obtain minimum 3 competitive bids on all cash allowances or proceed as instructed by the *Consultant*.
- .6 *Owner* reserves right to call competitive bids on any or all cash allowances.
- .7 Relationship of *Contractor* and *Subcontractors* performing work to be paid out of cash allowances shall be strictly between *Contractor* and *Subcontractors* in same manner as for those *Subcontractors* not performing work to be paid out of cash allowances.
- .8 Any cash allowance or any unexpended portion of above cash allowances shall be credited to *Owner* on completion of the *Project* or expended as directed by the *Owner* at its sole discretion.
- .9 Refer also to General Conditions, GC 6.1.4 for requirements regarding payment for changes in the *Work* by means of Cash Allowance.
- .10 *Contractor* shall include in *Contract Price* and schedule cost and time required associated with *Contractors* obligation to perform the cash allowances *Work*. Costs carried by *Contractor* outside of the cash allowances amounts are to include indirect costs, overhead, profit, cleaning, applicable taxes, etc. in accordance with the requirements of Division 1, specifically Sections 01 32 00, 01 50 00, 01 77 00 and 01 74 13.

END OF SECTION

## PART 1 – GENERAL

### 1.1 SECTION INCLUDES

- .1 This Section includes the request for prices as follows:
  - .1 Unit Prices
  - .2 Alternative Prices
  - .3 Separate Prices
- .2 Prices included in the Contract shall be complete for the applicable work, and shall constitute the full consideration, payment, compensation and remuneration to the Contractor for all such work. For greater certainty, but without limitation to the foregoing, such prices shall constitute full and complete consideration, payment, compensation and remuneration to the Contractor for the following (subject to adjustments only as specified in the Contract Documents):
  - .1 Expenditures for wages and for salaries of workmen, engineers, superintendents, draftsmen, foremen, timekeepers, accountants, expeditors, clerks, watchmen and such other personnel as may be approved, employed directly under the Contractor and while engaged on the applicable work at the site and expenditures for traveling and board allowances of such employees when required by location of the applicable work or when covered by trade agreements and when approved; provided, however, that nothing shall be included for wages or salary of the Contractor if an individual, or of any member of the Contractor's firm if the Contractor is a firm or the salary of any officer of the Corporation if the Contractor is a corporation, unless otherwise agreed to in writing;
  - .2 Expenditures for material used in or required in connection with the construction of the applicable work including material tests and mix designs required by the laws or ordinances of any authority having jurisdiction and not included under Subparagraph .9;
  - .3 Expenditures for preparation, inspection, delivery, installation and removal of materials, plant, tools and supplies;
  - .4 Temporary facilities as required for the applicable work;
  - .5 Traveling expenses properly incurred by the Contractor in connection with the inspection and supervision of the applicable work or in connection with the inspection of materials prepared or in course of preparation for the applicable work and in expediting their delivery;
  - .6 Rentals of all equipment whether rented from the Contractor or others, in accordance with approved rental agreements including any approved applicable insurance premiums thereon and expenditures for transportation to and from the site of such equipment, costs of loading and unloading, cost of installation, dismantling and removal thereof and repairs of replacements during its use on the applicable work, exclusive of any repairs which may be necessary because of defects in the equipment when brought to the Work or appearing within thirty (30) days thereafter;
  - .7 The cost of all expendable materials, supplies, light, power, heat, water and tools (other than tools customarily provided by tradesmen) less the salvage value thereof at the completion of the applicable work;

- .8 Assessments under the Worker's Compensation Act, the Unemployment Insurance Act, Canada Pension Act, statutes providing for government hospitalization, vacations with pay or any similar statutes; or payments on account of usual vacations made by the Contractor to his employees engaged on the applicable work at the site, to the extent to which such assessments or payments for vacations with pay relate to the work covered by the specified price; and all sales taxes or other taxes where applicable;
- .9 The amounts of all Subcontracts related to the specified price;
- .10 Premiums on all insurance policies and bonds called for under this Contract as related to the specified price;
- .11 Royalties for the use of any patented invention on the applicable work;
- .12 Fees for licenses and building permits in connection with the applicable work;
- .13 Duties and all applicable taxes, except H.S.T., imposed on the applicable work; and
- .14 Such other expenditures in connection with the applicable work as may be approved;
- .15 Provided always that except with the consent of the Owner, the above items of cost shall be at rates comparable with those prevailing in the locality of the Work.

## 1.2 UNIT PRICES

- .1 Unit prices included in the Contract, and which were submitted as a part of the Bid, shall be based on units of measurement described in the bidding documents to include for labour, materials, preparation of shop drawings, design fees, delivery, handling, disposal of surplus material, overhead and profit, all applicable taxes except HST, and any other direct or indirect expenditures, of such work measured complete in place, and as further described in other Sections of the Specifications.
- .2 Unit prices for specified units of measurements shall apply to any and all work which can be measured in the said units regardless of the variations in productivity and job conditions, or the time when instructions to carry out that work will be issued.
- .3 Unit prices shall apply only to the net change in quantities for each unit of work in each change to the work, provided that the instructions to change have been given before the start of applicable work and/or ordering of equipment.
- .4 After the applicable work has started, the unit prices shall cover the new work without any credit for the work already completed. Work completed and to be removed to accommodate new work shall be paid for as described for Changes in the Work in the General Conditions on a lump sum or by cost and fixed or percentage fee basis.
- .5 Unit Prices for "CREDIT" shall be not less than 75% of Unit Prices for "EXTRA".
- .6 Unit Prices required are noted in Section 00 43 22

## 1.3 ALTERNATIVE PRICES

- .1 Alternative prices requested in the bidding documents and expressed as a credit or an extra to the Stipulated Price shall be used in calculation of the Contract Amount consistent with their acceptance or rejection by the Owner. The alternative prices required are noted in Section 00 43 23.

## 1.4 SEPARATE PRICES

- .1 Separate prices, requested in the Bid Documents and expressed as an extra to the Stipulated Price shall be used in calculation of the Contract Amount consistent with their acceptance or rejection by the Owner. The required separate prices are:
  - .1 Reserved

## 1.5 TAXES

- .1 Refer to Section 00 73 03, Amendments to CCDC 2 – 2008 - Stipulated Price, for requirements relating to the Harmonized Sales Tax (H.S.T.).

**END OF SECTION**

## PART 1 – GENERAL

### 1.1 APPROVED ALTERNATES AND APPROVED EQUALS

- .1 Named *Product* alternates or equals, indicated by the phrases "or approved alternate by XYZ Manufacturing" or "or approved equal by XYZ Manufacturing", shall be interpreted to mean that named *Product* alternate or equal, if selected for use in lieu of indicated or specified *Product*, meets or exceeds performance, appearance, general arrangement, dimensions, availability, code and standards compliance, and colour of specified *Product*. *Contractor* shall be responsible for costs and modifications associated with the inclusion of named *Product* alternate or equal at no additional cost to the *Owner*.
- .2 The process for proposing and approving alternates or equals shall be the same process as for proposing and approving substitutions (refer to paragraph 1.2 below).
- .3 Confirm delivery of specified items prior to proposing alternates or equals.

### 1.2 SUBSTITUTIONS

- .1 Submission of substitutions:
  - .1 Throughout all of the specifications including notes on the drawings unless a specification section says specifically and explicitly that a manufacturer is a sole source and that no substitutions are permitted, then the *Contractor* can propose and submit a substitution request to the *Consultant* in accordance with the requirements of this Section.
  - .2 Proposals for substitutions of *Products* and materials must be submitted in accordance with procedures specified in this section.
  - .3 *Consultant* may review submissions, if directed by *Owner*, but in any case with the understanding that the *Contract Time* will not be altered due to the time required by the *Consultant* to review the submission and by the *Contractor* to implement the substitution in the *Work*.
  - .4 *Consultant's* services to review substitutions will be performed on an additional services basis to their contract with the *Owner*. Costs of these services will be discounted from any reductions in the *Contract Price* that might be forthcoming from the substitution. Therefore, to be acceptable, a substitution must present a reduction in the construction cost at least equal to the cost to the *Owner* of the *Consultant's* additional services to review the substitution. *Contractor* shall cover directly costs and administration associated with courier services, reproduction costs, and other direct costs associated with these substitution reviews.
- .2 Submission requirements:
  - .1 Description of proposed substitution, including detailed comparative specification of proposed substitution with the specified *Product*.
  - .2 Manufacturer's *Product* data sheets for proposed *Products*, with commentary on product characteristics compared to originally specified product as "equal" or "better".
  - .3 Respective costs of items originally specified and the proposed substitution.
  - .4 Confirmation of proposed substitution delivery, in writing by *Product* manufacturer.
  - .5 Compliance with the building codes and requirements of authorities having jurisdiction.
  - .6 Affect concerning compatibility and interface with adjacent building materials and components.
  - .7 Compliance with the intent of the *Contract Documents*.
  - .8 Effect on *Contract Time*.



- .9 Reasons for the request.
- .10 Only *Contractors* submissions to the *Consultant* for alternatives/substitutions will be reviewed.
- .3 Substitutions submitted on *Shop Drawings* without following requirements of this section prior to submission of the affected shop drawings will cause the shop drawings to be rejected.
- .4 Proposed substitutions shall include costs associated with modifications necessary to other adjacent and connecting portions of the *Work*.
- .5 *Consultants* decision concerning acceptance or rejection of proposed substitutions is final. Should it appear to the *Consultant* that the value of services required to evaluate the substitution exceeds the potential reduction, the *Consultant* will advise the *Owner* that the substitution does not merit consideration before proceeding with a full evaluation. If the substitution will produce a reduction commensurate with or exceeding the value of the *Consultant's* services to evaluate the substitution, the *Consultant* will request the *Owners* direction to proceed with evaluation.

END OF SECTION

## PART 1- GENERAL

### 1.1 REQUEST FOR INFORMATION - RFI

- .1 Request for Information (RFI), is a formal process used during the *Work* to obtain interpretation of the *Contract Documents* pursuant to the General Conditions.
- .2 Submittal procedures:
  - .1 RFI Submittal Process:
    - .1 RFI's shall be processed and submitted to *Consultant* on a tabulated form with the following information.
      - .1 Date Submitted
      - .2 RFI # (including revision)
      - .3 Subject
      - .4 Description/ Question
      - .5 Recommendation/ Proposed Solution
      - .6 Any sketches, photos or other pertinent information to help clarify request.
    - .2 Submit RFIs sufficiently in advance of the affected work to not cause delay in the performance of the *Work*. Costs resulting from failure to do this will not be paid by the *Owner*.
    - .3 RFIs shall be submitted to the *Consultant* with copies to the *Owner*.
    - .4 RFIs shall be submitted only by *Contractor*. RFIs submitted by *Subcontractors* or *Suppliers* shall not be accepted.
    - .5 Submit one distinct RFI per RFI form.
    - .6 *Consultant* shall review RFIs from the *Contractor*
      - .1 *Consultant's* response shall not be considered as a *Change Order* or *Change Directive*, nor does it authorize changes in the *Contract Price* or *Contract Time* or changes in the *Work*.
      - .2 Only the *Consultant* shall respond to RFIs. Response to RFIs received from entities other than the *Consultant* shall not be considered.
    - .7 Allow 10 *Working Days* for *Consultants* review of RFIs. Where the *Consultant* deems the nature of the RFI requires additional time for review, or where information required to accommodate review is not available or forthcoming from third parties; the *Consultant* shall advise the *Contractor* accordingly and where feasible advise of additional time required for review.
      - .1 *Consultant's* review of RFI commences on date of receipt by the *Consultant* of RFI submittal and extends to date RFI returned by *Consultant*.
      - .2 When the RFI submittal is received by *Consultant* before noon, review period commences that day; when RFI submittal is received by *Consultant* after noon, review period begins on the next *Working Day*.

- .8 Contractor shall satisfy itself that an RFI is warranted by undertaking a thorough review of the *Contract Documents* to determine that the claim, dispute, or other matters in question relating to the performance of the *Work* or the interpretation of the *Contract Documents* cannot be resolved by direct reference to the *Contract Documents*. Contractor shall describe in detail this review on the RFI form as part of the RFI submission. RFI submittals that lack such detailed review description, or where detail is insufficient, in the opinion of the *Consultant*, the RFI will not be reviewed by the *Consultant* and shall be rejected.
- .9 RFIs do not constitute 'notice of delay'.
- .10 Contractor shall create an RFI tracking log. RFI tracking log to be updated and distributed to *Owner* and *Consultant* team at each site meeting.

## 1.2 SUPPLEMENTAL INSTRUCTIONS

- .1 Refer to the General Conditions of the Stipulated Price Contract and Supplementary Conditions.

## 1.3 CHANGES IN THE WORK

- .1 Refer to Part 6 of the General Conditions of the Stipulated Price Contract and Supplementary Conditions.
- .2 On receiving a Contemplated Change Instruction from the *Consultant*, and in accordance with the General Conditions and the Supplementary Conditions and Amendments to CCDC 2 - 2008, submit copies of *Contractor* and *Subcontractor* price submissions together with detail and bonafide information for substantiation by the *Consultant*.
- .3 Prices shall clearly show initial and revised net quantities of labour in hours, material by item and equipment by item and hour as required to demonstrate the scope and cost of the proposed change.
- .4 Net amounts of the labour and material included in the change price shall be multiplied by the applicable current labour rate including all mandatory benefits and prevailing market prices for materials and or equipment. Where the proposed change is an increase to the *Contract Price* mark-up for overhead and profit may be added to the net price of the change in accordance with the General Conditions and the Supplementary Conditions and Amendments to CCDC 2 – 2008 unless payment is made from cash allowances in which case overhead and profit will not be applied.
- .5 Overhead shall include the indirect costs of the change such as: head office costs, off-site supervision and management, project manger and office/administrative personnel, change order preparation, research, estimating, negotiation, printing, distribution and associated travel, coordination and supervision of the work, purchasing, warranty and indirect cost associated with additional *Contract Time* required to implement the Change.
- .6 Cost of changes shall be limited to the direct cost of the change including:
  - .1 Labour physically employed in implementing the *Work*.
  - .2 New material and products employed in implementing the *Work*.
  - .3 Off-site material shipping and delivery costs by a third party.
  - .4 Restocking charges.
  - .5 Additional performance and payment bond premiums.
  - .6 Rental of special tools and equipment not already employed at the site from a third party.
  - .7 Extraordinary costs incurred directly as a result of the change.

- .8 Clean up costs are allowed as a direct cost of the change unless payment is made from cash allowances in which case clean up will not have been applicable and considered to have been carried in the *Contract Price*.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.1 GENERAL**

- .1 Provide the Work in accordance with the *Contract Documents* and be responsible for delays or costs resulting from failure to properly inspect or coordinate the Work, and for replacement or corrective work required.

### **1.2 IDENTIFICATION OF SYSTEMS**

- .1 Provide identification of electrical and mechanical system installations and other automated systems or equipment in compliance with *Contract Documents*.

### **1.3 COMMISSIONING AND SYSTEMS DEMONSTRATIONS**

- .1 Provide testing, adjusting, balancing and certification and commissioning of mechanical and electrical installations and other automated systems or equipment in accordance with Section 01 77 00.
- .2 Instruct Owner's designated representatives in operation and maintenance of mechanical and electrical installations and other automated systems or equipment, in accordance with Section 01 77 00.

### **1.4 PROJECT MANAGER AND SUPERINTENDENT**

- .1 Provide project manager, superintendent and necessary supporting staff personnel who shall be in attendance at the *Place of the Work* while Work is being performed, with proven experience in erecting, supervising, testing and adjusting projects of comparable nature and complexity.
- .2 The Contractor shall appoint project manager at the *Place of the Work* who shall have overall authority at the *Place of the Work* and shall speak for the Contractor and represent the Contractor's interest and responsibilities at meetings at the *Place of the Work* and in dealings with the *Consultant* and the *Owner*.
- .3 The project manager shall fulfill the role of supervisor in accordance with GC 3.6.

### **1.5 SUPERINTENDENT**

- .1 The Contractor shall appoint a superintendent at the *Place of the Work* who shall have overall authority at the *Place of the Work* and shall speak for the Contractor and represent the Contractor's interest and responsibilities at meetings at the *Place of the Work* and in dealings with the *Consultant* and the *Owner*.
- .2 Appointed superintendent must have minimum 10 year experience in construction within a fully operating hospital setting, with operating room and lab experience.
- .3 Provide superintendent and necessary supporting staff personnel who shall be in fulltime attendance at the *Place of the Work* while Work is being performed including the completion of deficiencies, with proven experience in erecting, supervising, testing and adjusting projects of comparable nature and complexity. Owner has right to stop work if work takes place in the absence of the Superintendent.
- .4 Superintendent must ensure that all personnel working on site are trained as required by law and are certified to perform their assigned duties. Superintendent should also ensure each personnel are wearing their identification at all times while on Owner's property.
- .5 Superintendent shall review site in entirety at the end of each shift for cleanliness and safety.
- .6 Superintendent shall ensure digital gauges and HEPA negative pressure units are working properly at the beginning and end of each shift. Maintain record of air pressure at the beginning and end of each shift, and keep log on site and available for review by Owner and Consultant at all times.

- .7 Superintendent shall ensure each personnel has read Section 01 35 23 – Owner’s Rules and Regulation, Section 01 35 26 – Safety Requirements, Section 01 35 33 – Infection Control During Construction, including Appendices A to D, on the first day of work on site prior to starting any work. Superintendent to maintain a log of personnel’s name, date which he/she has reviewed the sections in entirety, and their signature. Append the above noted specification sections to the log book, separate from the site copy of the project specifications. Log shall be kept on site at all times for review by Owner’s representative.
- .8 Superintendent shall complete the formal IPC course held at Sick Childrens’ Hospital within 8 weeks from issuance of the Letter of Award, or Purchase Order, whichever comes first. A copy of course registration to be provided to architect and Owner’s project manager with 3 weeks of issuance of the Letter of Award, or Purchase Order, whichever comes first.
- .9 Owner has right stop work if the above requirements are not met.

## 1.6 STAFF

- .1 All *Contractors* and *Subcontractors* will be expected to maintain the staff team identified in the bid form. Any modifications to the team composition from those submitted 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*.
- .2 Each personnel in the construction team must wear their identification badges which includes their name and company while on the Owner’s property. Owner (Owner’s PM, security, any staff) has right to stop work if Contractor’s and sub-contractors’ personnel are found not wearing their identification badges.
- .3 Designate one personnel as loading dock foreman. Loading dock foreman must remain on site for entire length of time while in-coming or out-going materials are within the loading area.

## 1.7 DIMENSIONS

- .1 Verify dimensions at the *Place of the Work* before commencing shop drawings. Before fabrication commences report discrepancies to *Consultant* in writing. Incorporate accepted variances on shop drawings and as-built records.

## 1.8 COORDINATION

- .1 Coordinate and ensure workers, *Subcontractors*, and *Suppliers* cooperate to ensure that the *Work* will be carried out expeditiously and in proper sequence.
- .2 Make adjustments to allow adjustable work fit to fixed work.

## 1.9 BUILDING DIMENSION, TEMPLATES, BUILT-INS, AND COORDINATION

- .1 Take necessary dimensions for the proper execution of the *Work*. Assume complete responsibility for the accuracy and completeness of such dimensions, and for coordination.
- .2 *Provide* forms, templates, anchors, sleeves, inserts and accessories required to be fixed to or inserted in the *Work* and set in place or instruct separate *Subcontractors* as to their location.
- .3 Supply items to be built in, as and when required together with templates, measurements, shop drawings and other related information and assistance.
- .4 Pay the cost of extra work and make up time lost as a result of failure to provide necessary information and items to be built in.

- .5 Verify that the *Work*, as it proceeds, is executed in accordance with dimensions and positions indicated which maintain levels and clearances to adjacent work, as set out by requirements of the *Contract Documents*, and ensure that work installed in error is rectified before construction resumes.
- .6 Check and verify dimensions referring to interfacing of services. Verify such dimensions with interconnected portions of the *Work*.
- .7 Do not scale directly from drawings. Obtain clarification from *Consultant* if there is ambiguity or lack of information.
- .8 Details and measurements of any work which is to fit or to conform with work installed shall be taken at the *Place of the Work*.
- .9 Advise *Consultant* of discrepancies and omissions in the *Contract Documents*, that affect aesthetics, or that interfere with services, equipment or surfaces. Do not proceed with work affected by such items without clarification from *Consultant*.
- .10 Prepare and submit setting drawings, templates and other information necessary for the location and installation of material, holes, sleeves, inserts, anchors, accessories, fastenings, connections and access panels.
- .11 *Subcontractors* shall direct related *Subcontractors* on site of specific locations required for sleeves and openings.
- .12 Prepare interference report and drawings to properly coordinate the *Work* in accordance with Section 01 33 00.

#### 1.10 PROJECT COORDINATION AND RESPONSIBILITY

- .1 The *Contractor* shall coordinate the progress of the *Work*, mobilization areas of the *Place of the Work*, progress schedules, submittals, access to and use of the *Place of the Work* and facilities subject to any restrictions and conditions in accordance with the *Contract Documents*, reports and records, and any other processes, events, work, approvals, inspections and testing as may be required for the complete, proper and seamless execution of the *Work*.
- .2 The *Contractor* shall be solely responsible for ensuring that the complete *Contract Documents* are distributed to, or otherwise made available for review by, all *Subcontractors* and *Suppliers* as required for the complete and proper and informed coordination and execution of the *Work*. Failure in this regard will be the sole responsibility of the *Contractor* and will not be accepted as justification for a change in the *Work* and no change in the *Work* will be approved therefore.
  - .1 *Subcontractors* shall be responsible for reviewing the complete set of *Contract Documents*.
- .3 The *Contractor* is required to employ a competent supervisor and necessary assistants who shall be in attendance at the *Place of the Work* at all times throughout the progress of the *Work* when work is being performed. The *Contractor*, through the supervisor, shall maintain good order and discipline among the *Contractor's* employees engaged on the *Work*, and among and *Subcontractors* engaged on the *Work*.
- .4 The responsibility as to which *Subcontractor* or trade provides the required materials or articles, and/or builds-in articles, rests solely with the *Contractor* unless otherwise explicitly stated in the *Contract Documents*, or directed by the *Consultant*.
- .5 *Subcontractors* shall give the *Contractor*, in writing, instructions and information regarding their requirements as related to other parts of the *Work*.
- .6 There shall be cooperation at all times between the *Subcontractors* as required for the proper execution of the *Work*. *Subcontractors* shall supply others with the necessary accessories for building-in where required.

- .7 There shall be cooperation at all times with any representatives of any Inspection and Testing Companies (as may be retained by the Owner) during the performance of their duties.
- .8 Each *Subcontractor* shall report to the *Consultant* and the *Contractor*, in writing, any defects of surface or work, prepared by other *Subcontractors*, that adversely affects the work of their trade. Commencement of work shall imply acceptance of the prepared work otherwise.
- .9 Each *Subcontractor*, upon completion of their work, shall remove any equipment, surplus materials, and debris resulting from their work. Each *Subcontractor* shall also, and at their own expense, make good any damage to the work of another *Subcontractor* as a result of their own work. The definition of what constitutes "damage" shall be at the sole discretion of the *Consultant*.
- .10 Refer to *Drawings* for additional coordination requirements.

#### 1.11 OWNER'S REPRESENTATIVE

- .1 Owner's project manager is available between 9am to 5pm, Monday to Friday. Contractor to schedule all requirements and arrangements around these hours. Owner's project manager will not be available during statutory holidays and personal vacations. Owner's Project manager will notify Contractor of his/her vacation schedule and is to be included in the Six-week Detailed Look-Ahead.
- .2 All urgent matters to be communicated via email, shall be followed up by the Contractor to Owner's project manager at the earliest time possible during Owner's PM's business hours.

END OF SECTION



## PART 1 – GENERAL

### 1.1 ADMINISTRATIVE

- .1 Schedule and administer meetings every 2 weeks (or more frequently as required) with the *Consultant* throughout the progress of the *Work*. Schedules to be updated with the *Consultant* every 2 weeks for distribution at each meeting.
- .2 Prepare agenda for such meetings.
- .3 *Contractor* shall chair and record the minutes of such meetings, including Contract start-up meeting. *Consultant* shall provide agenda for Contract start-up meeting. *Contractor* shall distribute copies of minutes to the *Owner*, the *Consultant*, and all others in attendance within 3 days after date of meeting.
- .4 Distribute written notice of each meeting 4 days in advance of meeting date to the *Consultant* and the *Owner* and other affected parties.
- .5 Representatives of parties attending meetings shall be authorized to act on behalf of the parties they represent. *Subcontractors* and *Suppliers* do not attend meetings unless authorized by the *Consultant* and the *Owner*.
- .6 Prepare and distribute monthly progress reports containing updated schedules, six-week detailed look-ahead, shop drawing logs, submittals and budget.

### 1.2 CONTRACT START-UP MEETING

- .1 Within 5 days after award of *Contract*, the Architect will request a meeting of parties in *Contract* to discuss and resolve administrative procedures and responsibilities prior to the commencement of the *Work*.
- .2 The *Owner*, the *Consultant*, the *Contractor*, site superintendent(s), and inspection and testing company will be in attendance.
- .3 Agenda will be provided by the *Consultant* and shall include but not be limited to the following:
  - .1 Appointment of official representative of participants in the *Project*.
  - .2 Status of permits, fees and requirement of authorities having jurisdiction. Action required.
  - .3 Construction Schedule and progress scheduling.
  - .4 Schedule of submission of samples, colour chips, and items for *Owners* and/or *Consultant's* consideration.
  - .5 Requirements for temporary facilities, signs, offices, storage sheds, utilities, fences, Section 01 50 00.
  - .6 Requirements for notification for reviews. Allow a minimum of 48 hours notice to *Consultant* for review of the *Work*.
  - .7 Delivery schedule of specified equipment, Section 01 33 00.
  - .8 Safety Requirements, Section 01 35 26.
  - .9 Contemplated change orders, *Change Orders*, *Change Directives*, Request for Information (RFI), *Supplemental Instructions*, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
  - .10 *Owner* supplied *Products*.
  - .11 Record drawings, Section 01 77 00.
  - .12 Maintenance manuals, Section 01 77 00.

- .13 Take-over procedures, acceptance, warranties, Section 01 77 00.
  - .14 Progress claims, administrative procedures, holdbacks.
  - .15 Appointment of inspection and testing agencies or firms, Section 01 41 00.
  - .16 Insurances, transcripts of policies.
  - .17 *Contractor's* safety procedures.
  - .18 Cleaning area for vehicles.
  - .19 Workplace Safety and Insurance Board Certificate.
  - .20 Staging and storage requirements.
  - .21 Final photographs, Section 01 32 00.
- .4 Consultant will prepare and distribute contract start-up meeting minutes.

### 1.3 PRE-INSTALLATION MEETINGS

- .1 During the course of the *Work* prior to *Substantial Performance of the Work*, Contractor will schedule pre-installation meetings as directed by the *Consultant*.
- .2 Agenda to include the following:
  - .1 Appointment of official representatives of participants in the *Project*.
  - .2 Review of existing conditions and affected work, and testing thereof as required.
  - .3 Review of installation procedures and requirements.
  - .4 Review of environmental and site condition requirements.
  - .5 Schedule of the applicable portions of the *Work*.
  - .6 Schedule of submission of samples, colour chips, and items for *Owners* consideration.
  - .7 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences, Section 01 50 00.
  - .8 Requirements for notification for reviews. Allow a minimum of 48 hours notice to *Consultant* for review of the *Work*.
  - .9 Requirements for inspections and tests, as applicable. Schedule and undertake inspections and tests in accordance with Section 01 41 00.
  - .10 Delivery schedule of specified equipment.
  - .11 Special safety requirements and procedures.
- .3 The following shall be in attendance:
  - .1 *Contractor*.
  - .2 *Subcontractors* affected by the work for which the pre-installation meeting is being conducted.
  - .3 *Consultant*.
  - .4 *Manufacturer's* representatives.
  - .5 Inspection and testing company, as applicable.

### 1.4 PROGRESS MEETINGS

- .1 During the course of the *Work* prior to *Substantial Performance of the Work*, Contractor will schedule progress meetings bi-weekly or more frequently as required.

- .2 Agenda to include the following:
  - .1 Review, approval of proceedings of previous meeting.
  - .2 Review of items arising from proceedings.
  - .3 Review of progress of the *Work* since previous meetings.
  - .4 Review of RFIs log.
  - .5 Field observations, problems, conflicts.
  - .6 Problems that impede Construction Schedule.
  - .7 Review of Six-Week Detailed Look-ahead.
  - .8 Review of off-site fabrication delivery schedules.
  - .9 Review material delivery dates/schedule.
  - .10 Corrective measures and procedures to regain Construction Schedule.
  - .11 Revisions to Construction Schedule.
  - .12 Progress, schedule, during subsequent period of the *Work*.
  - .13 Review submittal schedules: expedite as required.
  - .14 Maintenance of quality standards.
  - .15 Pending changes and substitutions.
  - .16 Review of contemplated change orders, *Change Orders*, *Change Directives*, *Supplemental Instructions* for effect on Construction Schedule and on *Contract Time*.
  - .17 Review of status of as-built documents.
  - .18 Final photographs, Section 01 32 00.
  - .19 Other business.

## 1.5 PRE-TAKEOVER MEETING

- .1 Prior to application for *Substantial Performance of the Work*, schedule a pre-takeover meeting.
- .2 Agenda to include the following:
  - .1 Review, approval of proceedings of previous meeting.
  - .2 Review of items arising from proceedings.
  - .3 Review of procedures for *Substantial Performance of the Work*, completion of the Contract, and handover of the *Work*.
  - .4 Field observations, problems, conflicts.
  - .5 Review of outstanding contemplated change orders, change orders, supplemental instructions, and change directives, that may affect *Substantial Performance of the Work*.
  - .6 Problems which impede *Substantial Performance of the Work*.
  - .7 Review of procedures for deficiency review.
  - .8 Corrective measures required. Review of cost-sharing arrangements for hydro, heating, and other services.
  - .9 Progress, schedule, during succeeding period of the *Work*.

- .10 Review submittal requirements for warranties, manuals, and all demonstrations and documentation required for *Substantial Performance of the Work*.
- .11 Review of keying and hardware requirements.
- .12 Review of status of as-built documents and record drawings.
- .13 Status of *Commissioning* and training.
- .14 Review of RFIs log.
- .15 Final photographs, Section 01 32 00.
- .16 Other business.

## 1.6 POST-CONSTRUCTION MEETING

- .1 Prior to application for completion of *Contract*, schedule a post-construction meeting. 4 days prior to date for meeting, *Consultant* shall confirm a date for meeting based on evaluation of completion requirements.
- .2 Agenda to include the following:
  - .1 Review, approval of proceedings of previous meeting.
  - .2 Confirmation that no business is arising from proceedings.
  - .3 Confirmation of completion of the *Contract*, and handover of reviewed documentation from the *Consultant* to the *Owner*.
  - .4 Confirmation of completion of contemplated change orders, *Change Orders*, *Change Directives*, *Supplemental Instructions*.
  - .5 Problems which impede *Contract* completion.
  - .6 Confirmation of deficiency completion.
  - .7 Corrective measures required.
  - .8 Confirmation of cost-sharing arrangements for hydro, heating and other services.
  - .9 Confirm submittal requirements for warranties, manuals, and demonstrations and documentation for *Contract* completion are in order.
  - .10 Review of procedures for communication during post-construction period.
  - .11 Handover of reviewed record documents by the *Consultant* to the *Owner*.
  - .12 Handover of *Contract* completion insurance policy transcripts by *Contractor*.
  - .13 Submission of final application for payment.
  - .14 Review and finalize outstanding claims, pricing, and allowance amounts.
  - .15 Status of *Commissioning* and training.
  - .16 Demobilization and the *Place of the Work* restoration.
  - .17 Review of RFIs log.
  - .18 Other business.

## 1.7 SPECIAL MEETINGS

- .1 *Owner* and/or *Consultant* reserve the right to require special meetings which may be held on short notice and at which attendance by *Contractor* and representatives of affected *Subcontractors* and *Suppliers* is mandatory. *Contractor* shall keep detailed and accurate meeting notes and distribute copies promptly to all in attendance and those affected by agreements made at such meetings.

END OF SECTION

## PART 1 – GENERAL`

### 1.1 CONSTRUCTION PHOTOGRAPHS

- .1 Work shall include progress photographs of construction taken from eight (8) viewpoints within the areas of Work by a professional photographer. One photograph is to be taken from each viewpoint per month for the duration of construction and one upon completion of construction. Viewpoint locations to be determined by the *Consultant* at the time of photographing.
- .2 Photographs shall show general extent of the work by interior views. Each viewpoint will be selected by the *Consultant*, and the monthly repetitive photographs taken from exactly the same viewpoint.
- .3 Submit digital copies of each photograph with each application for payment.
- .4 Title each photograph at the bottom so that nothing pertinent is blocked out. Include on title: *Project* name, *Contractor's* name, direction of view, and date when taken. *Provide* photographers name only on back of photographs.
- .5 Professional Photographer for Construction Photographs shall be approved by the *Consultant*.

### 1.2 PROFESSIONAL FINAL PHOTOGRAPHS

- .1 Prior to release of deficiency holdback, the *Contractor* shall *Provide* to the *Consultant* the following required professional final photographs:
  - .1 Proof photographs of Professional Final Photographs taken from seven (7) vantage points selected by the *Consultant*.
  - .2 *Provide* 2 DVD copies of Record Photographs in PDF format and in high resolution editable .tiff and .jpg formats.

### 1.3 CONSTRUCTION PROGRESS REPORTING

- .1 Maintain at the *Place of the Work* a permanent written record of progress of Work. Make the record available to *Consultant* and provide copy if requested. Include in record each day:
  - .1 Commencement and completion dates of the work of each trade in each area of *Project*.
  - .2 Attendance of *Contractor's* and *Subcontractors* work forces at *Project* and a record of the work they perform.
  - .3 Visits to *Place of the Work* by *Owner*, *Consultant* authorities having jurisdiction, inspection and testing companies, *Contractor*, *Subcontractors*, and *Suppliers*.

### 1.4 SCHEDULING ROLES

- .1 *Contractor*
  - .1 The *Contractor* is responsible for the preparation and maintenance of Construction Schedule information including the Construction Schedule and other schedules as defined herein. The *Contractor* is responsible for obtaining planning and scheduling information from its management staff, site supervisory staff, *Subcontractors* and suppliers in a timely manner as an essential part of the preparation and maintenance of the Construction Schedule and other schedules as defined herein.
  - .2 The *Contractor* maintains full responsibility for the implementation and management of the construction activities contained in their schedules.

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- .3 The *Contractor* is to identify to the *Owner* and *Consultant* the *Contractor's* designated individual responsible for utilizing the specified scheduling software to prepare and maintain the Construction Schedule and other schedules, herein defined as the *Contractor's* Scheduler. The *Contractor's* Scheduler is required to have a minimum of 5 years of experience utilizing the specified scheduling software for planning and scheduling of hospital construction projects.

## 1.5 SCHEDULING SOFTWARE

- .1 The Construction Schedule is to be developed utilizing Microsoft Project (2003 or later version). Other third party scheduling softwares not acceptable.

## 1.6 SCHEDULES

- .1 Construction Schedule: Submit a detailed critical path bar chart Construction Schedule with activities itemized to show the orderly planning, organization and execution of the *Work*, which will enable the *Contractor*, *Consultant* and *Owner* to monitor the progress of the *Work* and forecast remaining *Work*. Include in the schedule, the milestone dates for completion of each phase and other milestones specific herein.
- .2 The Construction Schedule is to be in the form of a series of activities and milestones that are logically linked utilizing the critical path methodology.
- .3 The Construction Schedule must clearly represent the applicable sequence of work as outlined in the *Contract Documents*. The Construction Schedule must identify early dates and late dates as well as the *Project* critical path of activities and completion milestones through each phase of the *Project*.
- .4 Organize the Construction Schedule into the *Project's* phases as outlined in the *Contract Documents*. The Construction Schedule shall clearly identify the inter-relationships and logic dependencies between the work of different phases.
- .5 At any given point in time, the Construction Schedule must be fully detailed with activities and milestones for at least the next twelve (12) calendar months or for the entire project duration for projects under 12 months construction time. The level of schedule activity detail beyond the next twelve calendar months can be at a summary level that identifies major groups of activities and milestones for each phase.
- .6 The *Contractor* shall provide further refined and expanded schedule information, as the *Work* progresses and in sufficient advance of the upcoming work. Dates for the development of this information shall be agreed with the *Owner*, *Consultant*.
- .7 In addition to the Construction Schedule, prepare and submit the following schedules, as specified in Section 01 33 00.
- .1 Submittal Schedule for *Shop Drawings*, *Product Data* and *Samples*
  - .2 Submittal Schedule for *Mock-ups*
  - .3 Submittal Schedule of *Owner* supplied/*Contractor* installed equipment
  - .4 Equipment Delivery Schedule
  - .5 Building *Commissioning* and Turnover schedule, to be prepared together with *Owner*.

## 1.7 CONSTRUCTION SCHEDULE INFORMATION

- .1 Submission of the Construction Schedule shall constitute the representation by the *Contractor* that:

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- .1 The *Contractor* has distributed the proposed Construction Schedule to the *Subcontractors* for their review and comment.
  - .2 Seasonal weather conditions have been considered and included in the planning and scheduling of the *Work* influenced by high and low ambient temperatures and/or precipitation to ensure completion of the *Work* in accordance with the *Contract Documents*.
  - .3 The *Contractor* has incorporated any other special conditions in planning the *Work* such as specified non-work periods, etc.
  - .4 The *Work* has been co-ordinated and scheduled to permit time for work associated with the allowances (cash allowances) included as part of this *Contract*.
  - .5 The *Work* has been co-ordinated and scheduled to permit time for work associated with the alternatives included as part of this *Contract*.
  - .2 Include the dates for the commencement and completion of each major task for each distinct part of the *Project* construction. Activities shall be itemized to show the orderly planning, organization and execution of the *Work*, which will enable the *Contractor* and the *Owner* to monitor the progress of the *Work* and forecast remaining *Work*.
  - .3 Include activities in the Construction Schedule for the commencement and completion of each major element of all *Contractor* and *Subcontractor* work. Identify *Contractor* activities and events that affect the operations of the *Owner* including but not limited to:
    - .1 Submission of insurance and bonds.
    - .2 Erection and removal of construction barriers and other temporary works.
    - .3 Periods of *Contractor* access.
    - .4 Changes to *Owner* access and exiting.
    - .5 Changes / downs to mechanical, electrical, medical, communications systems.
    - .6 Equipment decommissioning, installation and re-commissioning.
    - .7 Other access requirements for demolition and new work in existing building.
    - .8 Demolition
    - .9 Partitions
    - .10 Ceilings
    - .11 Finishes
    - .12 Equipment Relocations & Installations
    - .13 Mechanical and electrical rough in
    - .14 Mechanical and electrical finishing's
    - .15 Mechanical and electrical systems and commissioning
    - .16 Inspections, deficiency correction
    - .17 Handover to *Owner*.
  - .4 Include specific activities and milestones in the Construction Schedule for work under the responsibility of the *Owner* that must coordinate with the *Contractor's* work including but not limited to *Owner* supplied equipment, vacancy and move-in periods. Such activities will be identified by the *Contractor* and *Owner*.



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- .5 Include specific activities and milestones in the Construction Schedule for work under the responsibility of the *Consultant* that must coordinate with the *Contractor's* work including but not limited to inspections and approvals. Such activities will be identified by the *Contractor* and *Consultant*.

## 1.8 FORMAT

- .1 Prepare the Construction Schedule in the form of a time-scaled, horizontal bar chart that clearly identifies the *Project* critical path of activities and completion milestones for the distinct phases and sub-phases of the *Project*. Provide a separate bar identifying the start and finish of each significant element of construction as required to define a clear progression of activities through the distinct phases/sub-phases of the *Project* as specified in the *Contract Documents*.
- .2 Show sufficient detail to identify the major activities and milestones dates for overall planning and coordination purposes. Activities (with the exception of the contingency for unforeseen delays and delays resulting from changes to the *Contract*) shall have a maximum duration of 4 weeks. Show milestones for the start and completion of each major work area, building system and phase or sub-phase of the *Work*.
- .3 Ensure that work of all disciplines (i.e. mechanical, electrical and all other trades) is included and logically linked within the Construction Schedule. Show manufacturing time and delivery dates (milestones) for major equipment and materials. Show deliveries of *Owner* supplied equipment required to meet the Construction Schedule.
- .4 Activities must be in sufficient detail to include for decisions / approvals required by the *Owner* and/or *Consultant* for shop drawings, mock ups, sample submissions, deliveries, cash allowance requirement schedule, off site fabrication, erection, on site installation and any other events or sub activities which may pertain to the activities of the Construction Schedule.
- .5 Construction Schedule information should be in sufficient detail to allow for accurate assessment of percentage completion and coordination with other tasks within the Project Master Schedule.
- .6 Provide a horizontal time scale identifying the first day of each week as Monday. Show in the Construction Schedule the intended working days and holidays used as the basis for the Construction Schedule information and critical path calculations.
- .7 Activity descriptions should be as a consistent and clear as possible in terminology. Start activity descriptions with verbs.
- .8 Include as part of the Construction Schedule information, "dependency logic" information indicating the major predecessor and successor links between schedule activities. When requested, identify the crewing assumptions for the Construction Schedule activities and dependency logic that is governed by or representing crewing availability.

## 1.9 SUBMISSION PROCESS

- .1 Submit the Construction Schedule information, to *Owner* within ten (10) working days from date of award of *Contract*. Construction Schedule information should be consistent with the milestones.
- .2 The *Owner* and *Consultant* shall have ten (10) *Working Days* from initial submission, to review and adjust the Construction Schedule, in consultation with the *Contractor*. The *Contractor* shall revise and resubmit the Construction Schedule for further review and comment. Upon final review, that Construction Schedule will be defined as the "Baseline" version of the Construction Schedule.

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## 1.10 BASELINE CONSTRUCTION SCHEDULE

- .1 The Baseline Construction Schedule will form the basis for *Contractor* and *Owner* planning and progress tracking.
- .2 No changes to the Baseline Construction Schedule reflecting later completion dates of activities or target milestones will be accepted as a revision to the Construction Schedule, unless accepted by *Owner* in writing.
- .3 Neither the review of the Baseline Schedule or other date submitted by the *Contractor* pursuant to this Section, nor any other action on the part of the *Consultant* under this section shall in any way be deemed as representation by *Owner* that the *Contractor*, by following a particular schedule or sequence of operation, can or will complete the *Work* by the time(s) required by the *Contract* or by any other time(s). The review of any Baseline Schedule or other date does not relieve the *Contractor* of his obligation to complete the *Work* by the time(s) required in the *Contract*.
- .4 Submit two paper copies on 11 x 17 inch (Ledger), plus electronic copy in native format from the agreed upon scheduling software. *Owner* will review schedule and return review copy.

## 1.11 PROGRESS SCHEDULE

- .1 On a monthly basis, update the Construction Schedule showing projected percentage of completion of each item as of the first day of the month. Indicate progress of each activity to date and projected start and finish dates for each activity. Upon submission this will be deemed the Progress Schedule.
- .2 Include the complete sequence of construction activities.
- .3 Show approved changes occurring since the previous submission of the Progress Schedule:
  - .1 Changes in scope/time
  - .2 Activities modified since previous submission
  - .3 Revised projections of progress and completion
  - .4 Other identifiable changes
- .4 Submit the Progress Schedule with each application for payment, clearly indicating progress of *Work* to date for which money is being claimed.
- .5 Submit a separate narrative report to define:
  - .1 Problem areas, anticipated delays and the impact on the schedule
  - .2 Corrective action recommended and its effect
- .6 Indicate slippage from the schedule, its impact on completion of the phase and the total *Project*, and possible corrective actions. Appropriate corrective action may include, but not be limited to, assignment of additional labour, trade *Subcontractors* or equipment, shift or overtime work at no additional cost to the *Owner*.
- .7 Submit a separate six week “look-ahead” narrative report indicating major activities to be undertaken or constructed, areas of work, and any impacts upon the *Owner* over the next month.

## 1.12 BASELINE SCHEDULE REVISIONS

- .1 Updating the Construction Schedule, as required, to reflect actual progress up to the monthly cut-off date shall not be considered a revision to the Baseline Schedule. All other changes, including, but not limited to, the following shall be considered Baseline Schedule revisions:
  - .1 Adding and/or deleting activity relationships

- .2 Adding and/or deleting activities
  - .3 Changes to original durations
  - .4 Changes to *Contract* Milestone dates or Constraint dates
  - .5 Performance of work out of sequence
  - .6 Scope Changes through Change Orders
- .2 If, as a result of the monthly Progress Schedule submission, it appears the Progress Schedule no longer represents the actual progress of the *Work*, the *Contractor* shall request, a revision to the Baseline Schedule in accordance with General Condition 6.2.

**END OF SECTION**

**PART 1 – GENERAL**

**1.1 GENERAL**

- .1 Submit a Schedule of Values to the *Consultant* at least 10 days prior to submitting first Application For Payment. Refer to attached sample and fill out applicable fields as instructed by the *Consultant*.
  - .1 For item 01 77 00, Project Books, Warranties and As Built Drawings, the Contractor is required to carry a value of five thousand dollars (\$25,000) in accordance with the attached sample.
  - .2 For item 01 31 13, Coordination and Preparation of Interference Drawings, the Contractor is required to carry a value of five thousand dollars (\$5,000) in accordance with the attached sample.
- .2 Upon request by *Consultant*, support values given with data that will substantiate their correctness.
- .3 Submit quantities of designated materials.
- .4 Refer to the General Conditions of the contract for details of payment procedure.
- .5 Schedule of Values will be used only as basis for Contractor's Application for payment.

**1.2 FORM OF SUBMITTAL**

- .1 Submit typewritten Working Schedule of Values on 8½" x 11" white paper, in accordance with sample schedule included in this Section at the end of each month. A summary version of the approved working model may be used for formal presentation with progress payment.

**1.3 REVIEW AND RE-SUBMITTAL**

- .1 After review by *Consultant*, revise and resubmit Schedule (and Working Schedule of Material Values), as required.
- .2 Resubmit revised schedule in same manner.

**1.4 SCHEDULE OF VALUES FORM SAMPLE**

No.	Description	Value	Compl.	Compl. %	Compl. This	Compl. Last	This %
	<b>DIVISION 1</b>						
01 00 01	Bonding						
01 00 02	Insurances						
01 00 03	Site Barricades and Temporary Enclosures						
01 00 04	Site Office and Associated Fixtures						
01 00 05	Site Progress Records (As-built drawings)						
01 00 06	Schedule and Updating						
01 00 07	Cleaning during construction (interior)						
01 00 08	Garbage Disposal						
01 00 09	Office Salaries and Overhead						
01 00 10	Project Manager (s)						
01 00 11	Site Superintendent (s)						
01 00 12	Licenses and Permits						
01 00 13	Temporary Power & Water						
01 00 14	Interior Barricades/Protection						

No.	Description	Value	Compl.	Compl. %	Compl. This	Compl. Last	This %
01 00 15	Equipment Rentals						
01 00 16	Progress Photos						
01 00 17	Shop Drawings (may be sub-categorized by trades)						
01 00 18	Samples (may be sub-categorized by trades)						
01 00 19	Project Data Books & Warranties	\$25K					
01 00 20	Coordination and Interference Drawings	\$5K					
01 00 21	Final Cleaning						
01 00 22	General Contractor Commissioning Activities						
01 00 23	Health & Safety Initiatives						
01 00 24	Communications						
01 00 25	Printing						
01 00 26	Other General Expenses (Itemize)						
01 00 27	Schedule Performance Security						
01 00 28	Cash Allowances (to be broken down by item)						
	<b>DIVISION 2</b>						
02 41 19	Selective Demolition						
	<b>DIVISION 3</b>						
	N/A						
	<b>DIVISION 4</b>						
	N/A						
	<b>DIVISION 5</b>						
05 50 00	Metal Fabrications						
	<b>DIVISION 6</b>						
06 10 13	Wood Blocking						
06 41 11	Architectural Cabinetwork						
	<b>DIVISION 7</b>						
07 81 16	Cementitious Fireproofing						
07 84 00	Firestopping and Smoke Seals						
07 92 00	Joint Sealants						
	<b>DIVISION 8</b>						
08 11 13	Metal Doors and Frames						
08 14 00	Wood Doors						
08 31 13	Access Doors and Frames						
08 71 00	Finish Hardware						
08 80 00	Glass and Glazing						
	<b>DIVISION 9</b>						
09 03 95	Terrazo Restoration						
09 21 16	Gypsum Board Assemblies						
09 51 13	Acoustic Panel Ceilings						
09 65 10	Resilient Flooring						
09 91 00	Painting						
	<b>DIVISION 10</b>						
10 11 00	Visual Display Surfaces						
10 14 19	Signage						
10 21 24	Cubicle Curtains						
10 26 13	Wall and Door Proection						

No.	Description	Value	Compl.	Compl. %	Compl. This	Compl. Last	This %
10 28 14	Accessories						
	<b>DIVISION 11</b>						
	N/A						
	<b>DIVISION 12</b>						
12 12 30	Art Hanging and Display Systems						
12 24 00	Window Roller Shades						
	<b>DIVISION 13</b>						
	N/A						
	<b>DIVISION 14</b>						
	N/A						
	<b>DIVISIONS 20, 21, 22, 23, 24, and 25</b>						
20 01 01	Mechanical General Requirements						
20 01 03	Mechanical Coordination and Installation						
	<b>DIVISIONS 26, 27 and 28</b>						
26 05 01	Electrical General Requirements						
26 05 34	Lighting Fixture Raceways						

END OF SECTION

## PART 1 - GENERAL

### 1.1 GENERAL REQUIREMENTS

- .1 Submit submittals as requested by the *Contract Documents*, as specified herein, and in accordance with the conditions of the *Contract*.
- .2 In addition to submittals specifically requested by the *Contract Documents*, submit other submittals as may be reasonably requested by the *Consultant*, or as are required to coordinate the *Work* and to provide the *Owner* with choices available, within the scope of *Contract Documents*.
- .3 Procedures and requirements for *Contract* closeout submittals shall be in accordance with the following sections:
  - .1 Section 01 77 00 - Contract Closeout Procedures and Submittals.
  - .2 Section 01 78 36 - Warranties.
- .4 *Contractor's* review of submittals:
  - .1 Review submittals for conformity to *Contract Documents* before submitting to *Consultant*. Submittals shall bear stamp of *Contractor* and signature of a responsible official in *Contractor's* organization indicating in writing that such submittals have been checked and coordinated by *Contractor*. *Contractor's* review shall be performed by qualified personnel who have detailed understanding of those elements being reviewed and of the conditions at the *Place of the Work* proposed for installation.
  - .2 Check and sign each submittal and make notations considered necessary before submitting to *Consultant* for review. Where submittal is substantially and obviously in conflict with requirements of *Contract Documents*, reject submittal without submitting to *Consultant* and request resubmission. Note limited number of reviews of each submittal covered under *Consultant's* services as specified above.
  - .3 *Contractor* shall assume sole responsibility for any conflicts occurring in the *Work* that result from lack of comparison and coordination of submittals required for the *Work*.
  - .4 Submittals that have not been reviewed, checked, and coordinated by *Contractor* prior to submission to *Consultant*, will be rejected.
- .5 Notify *Consultant* in writing of changes made on submittals from *Contract Documents*. *Consultant's* review of submittals shall not relieve *Contractor* of responsibility for changes made from *Contract Documents* not covered by *Contractor's* written notification to *Consultant*.
- .6 *Consultant's* review of submittals:
  - .1 Review of submittals by *Consultant* is for the sole purpose of ascertaining conformance with the general design concepts and the general intent of the *Contract Documents*. This review shall not mean that *Consultant* approves the detail design inherent in the submittals, responsibility for which shall remain with the *Contractor*. Such review shall not relieve the *Contractor* of responsibility for errors or omissions in the submittals, or responsibility for meeting requirements of *Contract Documents*. Be responsible for dimensions to be confirmed and correlated at the *Place of the Work* for information that pertains solely to fabrication processes or to techniques of construction and installation, and for coordination of the *Work*.

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- .2 As part of their scope of work, *Consultant* shall review *Shop Drawings* no more than twice. Should three or more reviews be required due to reasons of *Contractor* omissions causing resubmission requests, then *Contractor* shall reimburse the *Consultant* for time expended in these extra reviews. Time shall be invoiced to the *Owner* (to be deducted from monies due to the *Contractor* and paid to *Consultant* by *Owner*) at rates recommended by *Consultant's* professional association and disbursements shall be invoiced at *Consultant's* cost. The *Contractor* shall cover directly costs and administration associated with courier services and the like for these extra *Shop Drawing* reviews.
  - .3 *Consultant's* review and markings on submittals do not authorize changes in the *Work* or the *Contract Time*, and will be accommodated at no increase in the *Contract Price*.
  - .4 Submittals received but not required by the *Contract Documents* or requested by the *Consultant* will not be reviewed by the *Consultant* and will be marked 'NOT REVIEWED' by the *Consultant* and returned to the *Contractor*.
  - .7 Make submittals with reasonable promptness and in an orderly sequence so as to cause no delay in the *Work*. Be responsible for delays, make up time lost and pay added costs, at no increase in the *Contract Price*, incurred because of not making submittals in due time to permit proper review by *Consultant*. Keep log of submittals and review them every 2 weeks.
  - .8 Submittals that contain substitutions will be rejected. Substitutions are permitted only on substitution submittals as specified in Section 01 25 00.
  - .9 Do not proceed with work affected by a submittal, including ordering of *Products*, until relevant submittal has been reviewed by *Consultant*.
  - .10 Prepare submittals using Imperial units.
  - .11 *Contractor's* responsibility for errors and omissions in submittals is not relieved by *Consultant's* review of submittals.
  - .12 *Contractor's* responsibility for deviations in submittal from requirements of *Contract Documents* is not relieved by *Consultant's* review of submittal, unless *Consultant* gives written acceptance of specific deviations.
  - .13 Make any changes in submittal that *Consultant* may require, consistent with *Contract Documents*, and resubmit as directed by *Consultant*.
  - .14 Notify *Consultant*, in writing, when resubmitting, of any revisions other than those requested by *Consultant*.
  - .15 Engineered submittals:
    - .1 *Submittals* for items required to be sealed by professional engineer (or as otherwise indicated as engineered), shall be prepared under the direct control and supervision of a qualified professional engineer registered in the *Place of the Work*, and having minimum of \$1,000,000 professional liability insurance.
    - .2 A certificate of insurance indicating that the professional engineer under whose direct control and supervision the submittal has been prepared has the required professional liability insurance is to be submitted with submittals required to be sealed by professional engineer (or as otherwise indicated as engineered).
    - .3 Design includes post disaster building, seismic, life safety, sizing of supports, anchors, framing, connections, spans, and as additionally required to meet or exceed requirements of applicable codes, standards, regulations, authorities having jurisdiction, and design requirements of the *Contract Documents*.



- .4 The professional engineer responsible for the preparation of engineered submittals shall undertake periodic field review, at locations wherever the work of described by the engineered submittal is in progress, during fabrication and installation of such work, and shall submit a field review report after each visit. Field review reports shall be submitted to the *Consultant*, to authorities having jurisdiction as required, and in accordance with the building code. This also includes review of mock-ups if required.
- .5 Field reviews shall be at intervals as necessary and appropriate to the progress of the work described by the submittal to allow the engineer to be familiar with the progress and quality of such work and to determine if the work is proceeding in general conformity with the *Contract Documents*, including reviewed *Shop Drawings* and design calculations.
- .6 Upon completion of the parts of the *Work* covered by the engineered submittal, the professional engineer responsible for the preparation of the engineered submittal and for undertaking the periodic field reviews described above, shall prepare and submit to the *Consultant* and authorities having jurisdiction, as required, a letter of general conformity for those parts of the *Work*, certifying that they have been *Provided* in accordance with the requirements both of the *Contract Documents* and of the authorities having jurisdiction over the *Place of the Work*.
- .7 Costs for such field reviews and field review reports and letters of general conformity are included in the *Contract Price*.
- .16 Keep copies of reviewed submittals at the *Place of the Work* in a neat, orderly condition. Only submittals that have been reviewed by the *Consultant* and are marked with *Consultant's* review stamp, as applicable, are permitted at the *Place of the Work*.
- .17 The *Work* shall conform to reviewed submittals subject to the requirements of this section. Remove and replace materials or assemblies not matching reviewed submittals at no increase in the *Contract Time* and at no increase in the *Contract Price*.

## 1.2 SCHEDULE OF SUBMITTALS

- .1 Within 10 *Working Days* of award of *Contract* and before commencement of the *Work*, submit to the *Consultant* a detailed schedule of submittals required by the *Contract Documents*.
- .2 Indicate dates for submitting, review time, resubmission time, float time, and last date for meeting Construction Schedule.
- .3 *Consultant* will review submittal schedule and advise *Contractor* if volume and timing of submittals will permit timely review and response. *Consultant* may require modifications to submittals schedule in order to allow adequate time for review of submittals. Adjust submittals schedule and Construction Schedule as required to comply with *Consultant's* needs.
- .4 Make provisions in schedule for at least 10 *Working Days* for *Consultant's* review of submittals. When submittals have to be reviewed by one or more of *Consultant's* subconsultants, add 5 more *Working Days* for a 15 *Working Day* review period.
- .5 If the *Consultant* requires resubmission of submittals, allow for an additional 10 *Working Days* review for each resubmission.
- .6 If, at any time, the *Contractor* submits a large enough number of submittals such that the *Consultant* cannot process these submittals within 10 *Working Days*, the *Consultant*, within 3 *Working Days* of receipt of such submittal, will provide the *Contractor* with an estimate of the time necessary for processing same. The *Contractor* shall accommodate such necessary time at no increase in the *Contract Time* and at no increase in the *Contract Price*.

- .7 The *Contractor* shall periodically resubmit the submittal schedule to correspond to changes in the Construction Schedule. Such resubmissions shall maintain the minimum 10 *Working Day* period for the *Consultant's* review.
- .8 Schedule submissions of submittals well in advance of scheduled dates for installation, to provide lead time for reviews and possible resubmissions and for placing orders and securing delivery so as to avoid delays in the *Work*
- .9 Submittal log to be reported at every site meeting and distributed to the *Owner* and *Consultant Team*.

### 1.3 SUBMISSION PROCEDURES

- .1 Coordinate each submittal with requirements of the *Work* and *Contract Documents*. Individual submittals will not be reviewed until related information is available.
- .2 Distribute copies of submittals to parties whose work is affected by submittals except *Consultant* and *Owner* before final submission for review by *Consultant*.
- .3 Accompany submittals with transmittal letter, in duplicate, containing:
  - .1 Date.
  - .2 *Project* title and number.
  - .3 *Contractor's* name and address.
  - .4 Identification and quantity of each submittal.
  - .5 Other pertinent data.
- .4 Each submittal shall be identified numerically by relevant specification section number with a numeric indicator for multiple submittals by that section followed by revisions number, for example 04 05 00-01-R0.
- .5 After *Consultant's* review, distribute copies to affected parties.

### 1.4 SUBMITTALS FOR REQUESTS FOR INSTRUCTION (RFI)

- .1 *Consultant* will return submittal indicating comments and action taken for *Contractor's* use and distribution.

### 1.5 SCHEDULES

- .1 Schedules required in addition to the schedule of submittals specified above:
  - .1 Construction Schedule.
  - .2 *Product* delivery schedule.
  - .3 Building service interruption and shut-down schedule.
  - .4 Inspection and testing schedule.
  - .5 Samples schedule.
  - .6 Mock-ups schedule.
- .2 Format:
  - .1 Prepare schedules in the form of a PERT or GANTT or Microsoft Project chart method.
  - .2 Include a separate bar for each trade or operation.
  - .3 Include horizontal time scale identifying the first *Working Day* of each week.

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- .4 Format for listings: The chronological order of the start of each item or part of the *Work*.
  - .5 Identification of listings: By systems description.
  - .3 Construction Schedule:
    - .1 Include the complete sequence of construction activities, including provision for climate and weather.
    - .2 Include the dates for the commencement and completion of each major element of the *Work* parallel to the sections of the specifications.
    - .3 Thoroughly review Section 01 21 00 Allowances and incorporate adequate time into project schedule to perform activities covered by cash allowances.
    - .4 Show projected percentage of completion for each item as of the first *Working Day* of each week.
    - .5 Submit draft schedule for review, and incorporate responses to comments identified by *Consultant* and/or *Owner*.
    - .6 Show dates for the commencement and completion of inspection and testing.
    - .7 Show dates for building service interruptions and shut-downs.
    - .8 At each date of submission of schedule, indicate progress of each activity.
      - .1 Show changes occurring since previous submission of the Construction Schedule:
        - .1 Major changes in scope.
        - .2 Activities modified since previous submission.
        - .3 Revised projections of progress and completion.
        - .4 Other identifiable changes.
      - .2 Include a narrative report to define:
        - .1 Problem areas, anticipated delays, and the impact on the schedule.
        - .2 Corrective action recommended and its impact on the schedule.
    - .9 Submit revised Construction Schedule with each application for payment.
  - .4 *Product* delivery schedule:
    - .1 Include dates for delivery of *Products*, equipment, finish items, factory-finished manufactured items. Show last dates for order, shipment, and delivery in order to meet Construction Schedule.
  - .5 Inspection and testing schedule:
    - .1 Prepare schedule for inspection and testing by advance discussion with the selected inspection and testing company to determine the time required for the inspection and testing company to perform its tests and to issue each of its findings, and allow for required time in the Construction Schedule.

## 1.6 SIX-WEEK DETAILED LOOK-AHEAD

- .1 All fine detailed events scheduling noted in Contract of construction activities must be shown 6 weeks head of time in the Look-Ahead. Include shut-down schedule, shut-down type and affected services, hoarding construction period, demolition period, risk of vibration, excessive noise generation and odorous work, any work that has an impact on health and safety of staff, patients and the public, major deliveries, vacation time, and other milestones critical to the construction schedule, or impacts the operation of hospital outside of the Area of Work.

## 1.7 SHOP DRAWINGS AND PRODUCT DATA SHEETS

- .1 Submit *Shop Drawings* and *Product* data sheets on 3 prints.
- .2 Submit *Product* data sheets for requirements requested in the *Contract Documents* and as the *Consultant* may reasonably request where shop drawings will not be prepared due to a standardized manufacture of a *Product*. Manufacturers' catalogue cuts will be acceptable in such cases, providing that they are 213 mm x 275 mm (8-1/2" x 11") originals, and that they indicate options selected including sizes, colours, model numbers, options and other pertinent data. Submissions showing only general information are not acceptable.
- .3 The use of photographed *Consultants* drawings or photocopied for shop drawing purposes is not acceptable. The *Contractor* shall not reproduce, in any manner, portions of the *Contract Documents* either in whole or in part and submit such as part of the shop drawing submission.
- .4 Lettering on *Shop Drawings* shall be not less than 3 mm (1/8") high.
- .5 Where requirements of *Contract Documents* are more stringent than design proposed on shop drawings, the requirements of the *Contract Documents* take priority.
- .6 *Consultant* markings and resulting action required:
  - .1 *Shop Drawings* requiring no changes will be marked 'REVIEWED', and shall be submitted for as-built drawings purposes.
  - .2 *Shop Drawings* requiring several changes will be marked 'REVIEWED as NOTED' and shall be revised and submitted for as-built drawings purposes.
  - .3 *Shop Drawings* requiring substantial changes will be marked 'REVISE AND RE-SUBMIT' and shall be revised and resubmitted until *Consultant* stamps drawings with 'REVIEWED' or 'REVIEWED as NOTED'.
- .7 *Shop Drawing* size shall be multiple of 213 mm (8-1/2") and 275 mm (11") excluding 38 mm (1-1/2") binding margin and not larger than 838 x 1117 mm (33" x 44"). Leave minimum 150x100mm (6" x 4") clear space for *Consultant's* comments.
- .8 Upon completion of review by *Consultant*, 1 marked set of prints will be returned to *Contractor* for reproduction and distribution.
- .9 Retain 1 complete set of prints of reviewed *Shop Drawings* for issuance to *Owner* immediately prior to *Substantial Performance of the Work*, in an acceptable, bound manner and in accordance with Section 01 77 00.
- .10 Submit copies of reviewed *Shop Drawings* to authorities having jurisdiction as required.
- .11 *Shop Drawings* shall show:
  - .1 Fabrication and erection dimensions.
  - .2 Plans, sections, elevations, arrangements and sufficient full size details which indicate complete construction, components, methods of assembly as well as interconnections with other parts of the *Work*.

- .3 Design calculations prepared by professional engineer, as required, substantiating sizes for members and connections based on design loads.
  - .4 Clear definition of the division of responsibility for the work described thereon. No *Products*, items or equipment, or description of work, shall be indicated to be supplied, or work to be done, "By Others" or "By Purchaser". Shop drawings marked with either of these phrases will be rejected without having been reviewed by the *Consultant*.
  - .5 Location and type of exposed anchors, attachments and locations and types of fasteners, including concealed reinforcements to accept mounted fasteners.
  - .6 Adhesives, joinery methods and bonding agents.
  - .7 Kinds and grades of materials, their characteristics relative to their purpose, detailed description of finishes and other fabrication information.
  - .8 Configurations, types and sizes required; identify each unit type on drawing and on *Product*.
  - .9 Descriptive names of equipment and mechanical and electrical characteristics when applicable.
  - .10 Data verifying that superimposed loads will not affect function, appearance and safety or work shown on shop drawings, as well as other interconnected work.
  - .11 Assumed design loadings, dimensions of elements and material specifications for load-bearing members.
  - .12 Proposed chases, sleeves, cuts and holes in structural members.
  - .13 Wall thicknesses of extrusions, shapes and dimensions.
  - .14 Location and types of welds. For structural welds use AWS symbols and clearly show net weld lengths and sizes.
  - .15 Materials, gauges, and sizes being supplied including connections, attachments, reinforcement, anchorage and locations of exposed fastenings.
  - .16 Installation instructions and details for *Products* to be installed by separate *Subcontractors*, including function of each part.
  - .17 A list of *Products* covered by, or included on, the shop drawing. List of *Products* shall be complete and show manufacturer's name, *Product* name, generic description, standard certification where specified, manufacturer's complete installation data and precautions against wrong installation, operation and maintenance.
  - .18 Refer to individual sections of the specifications for more particular requirements for shop drawings.
- .12 Compatibility statement: include with each *Shop Drawing* a statement that each *Product* and material indicated on the shop drawing is compatible with each other *Product* and material with which it comes into contact, including sealants and adhesives. Compatibility statement to be co-signed by each *Product* and material manufacturer whose *Product* or material is affected.

## 1.8 SAMPLES

- .1 Deliver 3 samples to *Consultant's* office or as instructed, with expenses, including carrying costs, prepaid, unless otherwise instructed.
- .2 Samples should be delivered at the same time as shop drawings and product data so that the *Consultant* has the complete package for reference and review.

- .3 Identify samples or assemblies by *Project* number and name, name of *Consultant*, *Contractor* and *Subcontractor*, and date of submission. Identify location, specified material reference and any other pertinent information. Show construction by layered method if necessary, clearly displaying textures and patterns.
- .4 Resubmit samples until acceptance by *Consultant* and *Owner*, as applicable, is achieved.

## 1.9 MOCK-UPS

- .1 Provide field or shop erected example of work complete with specified materials and workmanship.
- .2 Erect mock-ups at locations as specified and as acceptable to *Consultant*. Do not proceed with work for which mock-ups are required prior to *Consultant's* review of mock-ups.
- .3 Protect and maintain mock-ups until directed to be removed. Commence work demonstrated in mock-up only after review and acceptance of workmanship. If possible, mock-up may become part of finished work, at sole discretion of *Consultant*.
- .4 Reviewed and accepted mock-ups will become standards of workmanship and material against which installed work will be verified.
- .5 Remove and replace materials or assemblies not matching reviewed mock-ups.

## 1.10 PHOTOGRAPHS OF EXISTING CONDITIONS

- .1 Retain services of a competent and qualified professional crack survey company.
- .2 Take a series of photographs, as many as may be required, to establish existing conditions of adjacent grades, walls and structure of existing buildings prior to start of construction of this *Contract*. Carefully note all existing damages.
- .3 Upon completion of work of this *Contract*, take another series of photographs of same grades, walls and structures to indicate conditions of relevant areas of existing buildings.
- .4 Submit duplicate copies of all photographs to *Consultant* within 10 days after photographs have been taken.
- .5 *Contractor* shall make good all damages to the relevant existing grades, walls and structure of existing buildings that were not recorded prior to start of this *Contract*, at no additional expense to *Owner*.

## 1.11 DUST CONTROL PROGRAM

- .1 Prepare and submit a dust control program, which program shall include details of truck washing, street cleaning and wetting of excavation to the satisfaction of the authorities having jurisdiction.
- .2 Prevent contamination of and nuisance to adjacent areas and buildings near the *Work* from dust by taking appropriate dust control measures at such times as found necessary, and at other times complaints of dust are received from the public, local authorities having jurisdiction, *Owner* or *Consultant*.

## 1.12 COORDINATION AND INTERFERENCE DRAWINGS

- .1 General:

- .1 Preparation of Interference Drawings is the responsibility of the *Contractor* as it is the *Contractor* who bears the overall coordination responsibility of all trades for the project. The *Contractor* is the aggregator/complier of relevant existing conditions data gathered on site during and for the purpose of executing the work; such data is then to be used by the *Contractor* shall develop Interference Drawings in a pro-active manner, when issues can still be addressed, and not after trades have started installing their work. The *Contractor* shall not delegate the development of interference drawings down to subtrades as subtrades are not responsible for coordination of other trades that are in direct contract with the *Contractor*.
- .2 Prepare and circulate coordination and interference *Drawings* and details for coordination of the *Work*. As a minimum, prepare coordination and interference *Drawings* and details in connection with location of new and existing mechanical, plumbing, fire protection and electrical work in new and existing areas of the building where services will be exposed or where installation is not completely shown 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.
- .3 Division 21, 22, 23, 26, 27 and 28 shall submit interference *Drawings*. Submit interference *Drawings* in uniform scale on one print to allow overlays to be assembled. Upon incorporation of details, *Drawings* shall be submitted jointly to *Consultant* for review. Areas of conflict or interference shall be resolved in a mutually agreed manner between affected parties and resubmitted on said interference *Drawings* until such time as accepted by *Consultant*.
  - .1 Use applicable *Drawings* as a basis for preparation of coordination and interference *Drawings*. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
  - .2 Coordinate the addition of trade-specific information to the coordination and interference drawings by multiple *Subcontractors* in a sequence that best provided for coordination of the information and resolution of conflicts between installed components before submitting for review.
  - .3 Indicate functional and spatial relationships of components of architectural, structural, mechanical, and electrical systems.
  - .4 Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
  - .5 Show location and size of access doors required for access to concealed dampers, valves, and other controls located in gypsum partitions, in partitions behind built-in millwork, and gypsum and millwork ceilings.
  - .6 Indicate required installation sequences.
  - .7 Indicate dimensions shown on the *Drawings*. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to *Consultant* indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

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- .8 Coordinate placement of equipment to ensure that components will be properly accommodated within spaces *Provided* prior to commencement of *Work*. In areas where equipment and services are exposed care shall be taken to organize and layout services in an organized and orderly manner. Where possible services are to run parallel or at right angles to one another as required. *Consultant* may request that service layout be reconfigured to suit sightline concerns during the coordination *Drawings* review phase. These *Drawings* changes are to be executed at no additional cost to the *Owner*.
  - .4 Submit *Drawings* in PDF format (11"x17" maximum) to *Consultant* for review not less than 10 *Working Days* prior to construction of affected work.
  - .5 Take complete responsibility for remedial work that results from failure to coordinate the *Work* prior to fabrication and installation.
  - .6 Ensure that accesses and clearance required by jurisdictional authorities and/or for easy maintenance of equipment are *Provided* in layout of equipment and services.
  - .7 Prepare and circulate coordination and interference *Drawings* prior to placing orders for equipment and materials.
  - .8 Coordination and interference *Drawings* shall be circulated for mark-ups by *Subcontractors* responsible for work of Divisions 5, 9, 10, 12, Divisions 21, 22, and 23, and Divisions 26, 27, and 28.
  - .9 Coordinate preparation and submission of coordination and interference *Drawings* with *Shop Drawings*.
  - .10 In complex areas, show structural elements, piping, air handling and heating systems distribution, sprinkler system distribution, lighting, gypsum board wall and ceiling assemblies, acoustical isolation, *Products* and systems involving life safety, conveying systems, electrical distribution, as applicable.
  - .2 Coordination and Interference *Drawings* Organization: Organize *Drawings* as follows:
    - .1 Coordination and interference *Drawings* shall be produced in uniform scale on prints to allow overlays to be assembled. Upon incorporation of details, *Drawings* shall be submitted to *Consultant* for review. Areas of conflict or interference shall be resolved in a mutually agreed manner between *Subcontractors* and resubmitted on coordination and interference *Drawings* until accepted by *Consultant*.
    - .2 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*.
    - .3 Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related *Work*. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on *Drawings*. Indicate areas of conflict between light fixtures and other components.
    - .4 Structural Penetrations: Indicate penetrations and openings required for all disciplines.
    - .5 Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of insert and 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.



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- .6 Show cross sections in key areas, as required, and as defined by *Consultant*. Show re-bar, structural elements, piping, air handling and heating systems distribution, sprinkler system distribution, lighting, gypsum board wall and ceiling assemblies, acoustical isolation, *Products* and systems involving life safety, conveying systems, electrical distribution.
  - .7 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.
    - .4 Prepare sleeve and conduit *Drawings* for work of Divisions 21, 22, and 23 and Divisions 26, 27, and 28,, showing size and location of penetrations through load bearing elements.
    - .5 Show ductwork as 2 lines. Show cross sections in key areas, as required, and as directed by *Consultant*. Show re-bar, structural elements, air handling and heating systems distribution, gypsum board wall and ceiling assemblies, acoustical isolation, *Products* and systems involving life safety, conveying systems, and electrical distribution.
  - .8 Electrical Work: Show the following:
    - .1 Runs of vertical and horizontal conduit 1-1/4" diameter and larger.
    - .2 Light fixture, exit light, emergency battery pack, smoke detector, and other fire alarm locations.
    - .3 Panel board, switch board, switchgear, transformer, busway, generator, and motor control center locations.
    - .4 Location of pull boxes and junction boxes, dimensioned from column center lines.
    - .5 Prepare sleeve and conduit *Drawings* for work of Divisions 21, 22, and 23 and Divisions 26, 27, and 28, showing size and location of penetrations through load bearing elements.
  - .9 Fire Protection System: Show the following:
    - .1 Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
  - .10 Review: *Architect* will review coordination drawings to confirm that the *Work* is being coordinated, but not for the details of the coordination, which are the *Contractor's* responsibility. If the *Architect* determines that the coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, the *Architect* will so inform the *Contractor*, who shall make changes as directed and resubmit.

### 1.13 SUBCONTRACTOR QUALIFICATION STATEMENTS

- .1 Submit list of *Subcontractors* and *Suppliers* as required to complete the *Work*, for review by *Consultant*, immediately after award of *Contract*.
- .2 Submit completed CCDC 11 Contractor's Qualification Statement for *Subcontractors* and *Suppliers*, where qualifications are requested by *Consultant*, including but no limited to mechanical work, electrical work, building envelope work, and building finish work.

END OF SECTION

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**SUNNYBROOK HEALTH SCIENCES CENTRE HEALTH AND SAFETY RULES**  
(to be posted at job site)

1. COVID-19: In addition to Health and Safety rules required by the Owner, Contractor, Subcontractors and Suppliers are to practice safe physical distancing in accordance with health authority guidelines. Refer to Government of Ontario website for latest updates. [www.ontario.ca](http://www.ontario.ca)
2. Smoke tobacco in designated areas only. Never smoke in any location that contains a combustible or explosive condition or atmosphere.
3. No person who is impaired by alcohol or drugs shall enter and/or remain on the grounds.
4. Follow instructions; don't take chances. If you don't know, ask.
5. Immediately report to your supervisor any condition or practice you think might cause injury to employees or damage to equipment.
6. Put everything you use in its proper place. Disorder causes injury and wastes time, energy, and material. Keep your work area clean and orderly.
7. Any personnel operating equipment is to be duly authorized and instructed (licensed where practical) in the safe method of operation.
8. Whenever you, or the equipment you operate is involved in an accident, regardless of how minor, report it to your supervisor immediately. Get first aid promptly.
9. Repairs are to be made by authorized, licensed personnel only. Need for repairs must be reported to your immediate supervisor, and are not to be undertaken by non-qualified personnel.
10. Wear approved personal protective equipment as directed. Keep it in good condition.
11. All authorized visitors on the property are required to wear and use appropriate safety equipment.
12. Don't horseplay; avoid distracting others.
13. When lifting, bend your knees, grasp the load firmly, then raise the load, keeping your back as straight as possible. Get help for heavy loads.
14. Obey all rules, signs, and instructions.
15. In the event of an accident, the Occupational Health and Safety Clinic is located in H Wing, Ground Floor, room HG46.
16. A full report of any accident is to be submitted in writing to the Consultant's representative, within 24 hours of the occurrence.
17. The Contractor shall provide to the Owner's Safety Coordinator, the name and phone number of their health and safety delegate.
18. Before work begins, the Contractor shall deliver to the Sunnybrook Occupational Health and Safety Department - Safety Coordinator, a list of the chemical substances to be used in all work, and a Material Safety Data Sheet for each chemical substance (this is a WHMIS requirement).
19. The Contractor shall also provide a list of physical or biological agents produced by its work.

20. The *Contractor*, before the work commences, shall arrange a meeting where the *Contractor* and its workers are informed of the following:
1. the requirement to comply with the general health and safety rules required by Sunnybrook;
  2. the requirement to comply with the *OHS*A;
  3. the name and telephone number (both home and office) of the *Contractor*'s supervisor; and the health and safety representative, or members of the Subcontractors committee at the job site, whichever is applicable;
  4. the areas of the location to which the *Contractor* and the *Contractor*'s workers are allowed access;
  5. any special hazards at the job site of which the *Contractor* and/or its workers normally would be expected to be aware (for example, what to do in case of a fire);
  6. the requirements imposed upon the *Contractor* in the event that one of the *Contractor* workers is injured at work.
21. As the work progresses, planned inspections are to be made of areas/places where the *Contractor* and his workers are working to ensure the following:
1. the *Contractor* and his workers comply with health and safety laws;
  2. the and his workers comply with the *Owner*'s general health and safety rules;
  3. the *Contractor*'s work is not creating an unacceptable health and/or safety hazard for the *Owner*'s employees.
22. Comply with the attached *Contractor* Safety Requirements document.

**WHMIS**  
**WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM REQUIREMENTS**

1. Comply with Workplace Hazardous Materials Information System in accordance with the Occupational Health and Safety Act (OHSA) requirements.
2. Before commencement of Work and during full term of the Contract, provide a list with current Materials Safety Data Sheets (MSDS) of all hazardous materials proposed for use on Project. List and data sheets shall be delivered to Sunnybrook Occupational Health and Safety Department - Safety Co-ordinator.
3. Label hazardous materials used and/or supplied on the Project in accordance with WHMIS requirements.
4. Provide detailed procedures for safe handling storage and use of hazardous materials. List special precautions and safe cleanup and disposal procedures. Conform to Environmental Protection Act for disposal and cleanup requirements.
5. Obtain from the Owner, where applicable, a list and MSDS of hazardous materials that may be handled, stored or used by Owner's employees and/or Other Contractors retained by Owner at location where work of this Contract will be performed.
6. Ensure that those who handle, and/or are exposed to, or are likely to handle or to be exposed to hazardous materials, are fully instructed and trained in accordance with WHMIS requirements.

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## SUNNYBROOK HEALTH SCIENCES CENTRE

### CONTRACTOR'S ACKNOWLEDGEMENT

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 OHSAA, 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.

## SUNNYBROOK HEALTH SCIENCES CENTRE

### NOTICE OF DESIGNATED SUBSTANCES

The following Designated Substances are present at Sunnybrook Health Sciences Centre as outlined in the 'Limited Designated Substance Survey Report' dated December, 2017 by Maple Environmental Inc.

Designated Substance

Location

## SUNNYBROOK HEALTH SCIENCES CENTRE

### NOTICE OF BIOLOGICAL, CHEMICAL AND PHYSICAL HAZARDS

#### **Biological:**

Sunnybrook Health Sciences Centre (Sunnybrook) is a fully functioning hospital and medical research facility. As such any biological hazard that could infect a person outside the facility can be expected within the facility. This includes any communicable or non-communicable disease.

#### **Physical Hazards:**

Sunnybrook also contains physical hazards common to all public buildings. Contractors, their employees, and subcontractors must be aware of the general hazards associated with any kind of work in a full service public facility with residential living.

In addition to “normal” physical hazards there are also specific departmental hazards. Contractors must make their employees and subcontractors aware of the hazards they may encounter and the safety precautions to take. Contractors are required to contact SHSC departmental managers, and/or the safety office, and/or the Corporate Planning and Development or maintenance project manager regarding any specific hazards.

#### **Chemical Hazards:**

In addition to the designated substances mentioned under The Notice of Designated Substances there are approximately 5000 WHMIS regulated chemicals at Sunnybrook and several thousand chemicals covered by The Food and Drug Act, The Pest Control Act, The Atomic Energy Control Act, and the Explosives Act. All contractors are required to have their workers WHMIS trained to work on the premises. Contractors are required to contact SHSC departmental managers, and/or the safety office, and/or the Corporate Planning and Development or maintenance project manager regarding any specific hazards.



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**SUNNYBROOK HEALTH SCIENCES CENTRE SAFETY RULES APPLICABLE TO OUTSIDE CONTRACTORS AND THEIR EMPLOYEES ENGAGED TO WORK AT SUNNYBROOK**

(A) ALL CONTRACTOR'S PERSONNEL

1. Work in compliance with the provisions of the Occupational Health and Safety Act and the regulations, and in compliance with the employer's health and safety rules;
2. Use or wear any equipment, protective devices or clothing required by the Owner or by the employer;
3. Report missing or defective equipment or protective devices to the employer;
4. Report any known workplace hazard to the employer;
5. Report violations of safety legislation or safety rules to the employer;
6. Do not remove or make ineffective any protective device required by legislation, by SHSC or by the employer;
7. Do not use or operate any equipment or work in a way that might endanger oneself, or any other person;
8. Do not engage in any prank, contest, feat of strength, unnecessary running or rough or boisterous conduct.

(B) SUPERVISORY PERSONNEL (Person(s) having charge of the workplace or authority over the Contractor's employees)

1. Ensure that supervised employees work in compliance with the Occupational Health and Safety Act and regulations, these rules and the employer's health and safety rules;
2. Ensure that safety equipment, protective devices or clothing is used or worn by employees and visitors to the work site;
3. Advise employees and visitors to the work site of any potential or actual health or safety dangers known to exist;
4. Ensure appropriate training is given to employees about measures and procedures to be taken for their protection including, as required, (but not necessarily limited to): asbestos awareness training and WHMIS training);
5. Take every precaution reasonable in the circumstances for the protection of employees and any other persons at the work site.

**END OF SECTION**

## **PART 1 – GENERAL**

### **1.1 GENERAL REQUIREMENTS**

- .1 Read and be governed by conditions of the *Contract* and sections of Division 1.

### **1.2 CONSTRUCTION SAFETY MEASURES**

- .1 Comply with, and require workers and all *Subcontractors* to comply with, the requirements of safety rules prepared by *Owner* and all other applicable rules and requirements of the federal, provincial and municipal governments.
- .2 In event of conflict between any provisions of above authorities the most stringent provision will apply.
- .3 Submit to *Consultant* copies of all reports, orders, and stop work orders issued by the Ministry of Labour inspector or other government official.

### **1.3 FIRE SAFETY REQUIREMENTS**

- .1 Refer also to Section 01 51 16.
- .2 Comply with all fire safety regulations and procedures required by the provincial, municipal statutes and authorities.
- .3 During the entire construction period, provide ULC approved fire extinguishers and other fire fighting services and equipment, except where more explicit requirements are specified as the responsibility of individual *Subcontractors*.
- .4 Maintain clear emergency exit paths from each zone for personnel at all times.
- .5 Use only fire resistant tarpaulins and similar protective covering at the *Place of the Work*.
- .6 Ensure that each *Subcontractor* stores its volatile waste in closed containers and removes them from premises daily.

### **1.4 OVERLOADING**

- .1 No part of *Work* shall be loaded with loads which will endanger its safety or will cause permanent deformation.
- .2 Place temporary shoring under concrete members being loaded before they have attained 28 day strength.
- .3 Make every temporary support as strong as permanent support.
- .4 *Contractor* shall ensure the enforcing of all the above requirements and he shall be held solely responsible for damages and accidents due to overloading.

### **1.5 FALSEWORK**

- .1 Design and construct falsework in accordance with CSA S269.1 and the requirements of provincial, municipal statutes and authorities.

**END OF SECTION**

## PART 1 - GENERAL

### 1.1 GENERAL REQUIREMENTS

- .1 Read and be governed by conditions of the *Contract* and sections of Division 1.

### 1.2 POLICY SUBJECT: CONSTRUCTION AND RENOVATION

- .1 *Contractor* shall provide staff, *Subcontractor*, *Suppliers*, workers, own forces or anyone for whom the *Contractor* may be responsible, with training in infection prevention and control procedures. *Contractor's* training seminar shall be designed and implemented by an environmental *Consultant* with healthcare experience and whose educational program has been approved by the *Owner*. Acceptable firms but not limited to are:
  - .1 Maple Environmental (Kyle Prosser, Tel: 905-601-6301)
  - .2 Safetech Environmental Ltd. (Romeo Milano, Tel: 905-624-2722).
  - .3 Golder Associates (Jason McGonigle, Tel: 905-723-2727 Ext. 256)
- .2 *Contractor* is to directly engage and enter into a contract with the approved Environmental Consultant. *Contractor* to coordinate with the environmental Consultant and the *Contract Price* includes the required number of training sessions to adequately cover the duration of the *Project*.
- .3 Prior to commencement and during the course of the *Work*, as required, the *Contractor* shall promptly provide the *Owner* with written confirmation of such training by way of a certificate issued by the environmental Consultant.
- .4 *Owner's* Infection Prevention Control Services (IPCS) will investigate and advise on the risks of organisms that exist in the *Project* area. The goal will be to determine any infectious risks where possible and eliminate infection risks associated with construction activities in order to protect patients and staff occupying this building.
- .5 During the course of the *Work*, IPCS will assess the risks related to the *Project* utilizing the Risk Assessment and Preventive Measures Checklist (Appendix A). The determination of risk will guide the need for barriers during the *Project*. The *Owner* will communicate the assessment to the *Contractor* and advise on any additional measures to protect functional areas of the hospital.
- .6 Inspection of on-going infection control procedures shall be undertaken on a regular basis by the *Owner's* infection control representative and the *Contractor*. Procedures for such inspections shall be the same as those for inspection and testing in accordance with Section 01 45 00. The *Owner's* monitoring checklist is found in Appendix B.
- .7 IPCS may stipulate changes in protocols and barrier configurations if required to ensure the safety of the patients and the clinical environments. Barriers and hoarding are shown on the *Drawings* diagrammatically and as intent only. IPCS and *Contractor* to review on site barrier requirements and the *Contractor* will be responsible to construct barriers as per final instruction on site by the *Owner* at no additional cost to the *Owner*.
- .8 Definitions:
  - .1 Final cleaning is defined as; post construction cleaning as provided by the *Owner's* workforce or *Owner's* contracted cleaning service.
  - .2 Construction Personnel: Protective clothing is to be removed when exiting through patient areas or vacuumed when exiting through other areas as categorized by IPCS as specified in Appendix "A". Construction personnel will not pass through clinical areas of the hospital without approval from the IPCS or *Owner*.

- .1 Daily outer garments must be clean and maintained at all times.
  - .2 Daily footwear will be maintained clean and dust free at all times.
  - .3 Daily protective headgear will be maintained clean and dust free at all times.
  - .4 Hospital identification will be worn and displayed in a manner visible to any individual or passer by.
- .9 Transportation of Equipment/Supplies: Prior to commencement of the *Work*, IPCS and the *Project* team and the *Contractor* will establish paths and procedure for the transportation of clean/sterile supplies, equipment and construction materials, including the removal of construction debris. Additional information as indicated.
- .10 Construction Personnel to wear Hospital identification at all times and display in a manner visible to any individual or passer-by.
- .11 Construction Personnel: Construction personnel shall not pass through clinical areas of the hospital that reside beyond the *Contractor's Work* limits without approval from the IPCS or Owner.
- .1 Daily outer construction garments and PPE attire must be clean and maintained dust-free at all times.
  - .2 Daily construction footwear must be maintained clean and dust free at all times.
  - .3 Daily construction protective headgear shall be maintained clean and dust free at all times.
- .12 Surveillance: IPCS personnel will enhance surveillance as appropriate. Field review of the *Work* will be conducted on a regular basis with the *Contractor* as necessary.

### 1.3 SECTION INCLUDES

- .1 Any and all infection control procedures described in this Section and all such means, materials and methods that are required to contain and prevent *Work* environments from spreading infection to the adjacent Hospital environment.
- .2 Means, materials and methods include but are not limited to temporary hoardings and barriers, enclosures, containment capsules, vessels, and other air tight assemblies constructed to contain airborne particulate generated by the *Work* from/out of Hospital areas adjacent and outside the *Work* area. The employment of mobile HEPA filtered recirculation units will be required in *Work* areas such as inpatient areas, laboratories and other risk areas identified by the *Owner* or IPCS and also to maintain negative air pressure in general *Work* area(s) relative adjacent Hospital areas. Refer to 1.5.7.9 for additional information.

### 1.4 PRE-CONSTRUCTION

- .1 At *Contract* start-up meeting, at meetings convened prior to the start of the *Work*, at pre-installation meetings, and at regular progress meetings, each convened in accordance with Section 01 31 19, review infection prevention and control procedures. The *Owner's* infection control representative shall attend such meetings. Subjects to be reviewed include, but are not limited to, the following:
  - .1 General information on infection prevention measures are articulated in accordance with Canadian Standards Association Z317.13-07, Infection Control during Construction or Renovation of Health Care Facilities.
  - .2 Project and/or phases are subjected to preventative measures assessment and categorization in accordance with CSA Z317.13-07.

- .3 Schedule mandatory infection control training for all construction trade staff. Only those trade staff that have successfully completed mandatory infection control training are permitted to work at Sunnybrook Health Sciences. Trade staff without documented infection control training will be disqualified from the job site. Delays attributed to non documented staff will be at the cost and responsibility of the *Contractor*.
  - .4 General information on infection prevention measures is articulated.
  - .5 Patient populations that may be at risk are identified.
  - .6 Prevention measures for essential services (e.g. water, ventilation systems, electricity) that may be disrupted are provided.
  - .7 Integrity of the facility's exterior structure, spatial separations, ventilation and water supplies for any penetrations and infection control problems are reviewed and assessed daily to ensure all services that supply clinical areas are provided.
  - .8 Measures to control dust and routes to safely remove construction debris must be outlined and altered as necessary to protect all clinical areas and patients of the hospital. Traffic routes must be in accordance with cited CSA standard or requirements of the *Owner* whichever is more stringent.
  - .9 Traffic patterns for construction workers and supply delivery routes for construction materials will be established to minimize risks to patients, staff and visitors per the *Owner's* requirements and as indicated.
  - .10 Identify all critical areas of the ventilation system to ensure protection of the system from construction dust and debris including the need for increased filter changes during construction.
  - .11 Properly seal penetrations to mitigate dust and moisture travel between clinical areas and construction site including the need to close down dampers temporarily to reduce circulation of contaminated air or fumes is assessed.
  - .12 The systems can provide the correct air exchange rates and pressure relationships in critical areas near construction activity.
  - .13 Properly adjust exhaust and supply air flow in the construction area to ensure "negative pressure" gradient between construction (negative) and clinical (positive) areas.
  - .14 Properly protect all exterior air intakes as necessary to ensure optimal incoming "fresh air".
  - .15 Criteria of inspections by *Owner's* infection control representative.
  - .16 Ceiling/Wall/Floor Access permit requirements prior to opening concealed spaces (Section 01 10 00).
- .2 Vacuum cleaners:
- .1 Vacuums shall be commercial grade complete with HEPA filters.
  - .2 HEPA filter shall be changed as recommended by the manufacturer or required by use. Maintain a filter change log at the *Place of the Work*, available for review by the *Consultant*

## 1.5 CONSTRUCTION

- .1 Breaches in infection prevention containment measures, as outlined in Appendix A or as prescribed by CSA 317.13-07 or by the IPCS where negative outcome (s) that may place staff and/or patients of the *Owner's* facilities at risk will result in "stop" construction orders to the *Contractor* by IPCS.
- .2 Construction area and all related traffic routes will be maintained in an "acceptable" state of cleanliness as specified by the IPCS during the project without exception.

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- .3 Cleaning will be provided as categorized by IPCS as specified in Appendix "A". Refer also to Section 01 74 13 Cleaning. The *Place of the Work* must also be cleaned prior to and at completion of work as follows:
- .1 Undertaken by *Contractor* and included in the *Contract Price*:
    - .1 Construction cleaning prior to reopening a supply air duct during construction.
    - .2 Construction cleaning completed prior to the removal of any containment barriers.
    - .3 Construction cleaning completed after the removal of any barrier.
    - .4 Construction cleaning immediately after completion of minor work performed after the removal of barriers.
  - .2 Undertaken by *Owner* and not included in *Contract Price*:
    - .1 Final cleaning by Environmental Services must be completed prior to occupancy.
  - .4 Construction Cleaning is defined as the complete removal of "daily" construction debris, dust containment and mitigation measures during construction activities. Measures to contain and mitigate dust during construction activities include but are not limited to, daily vacuuming of the work area with a HEPA filtered vacuum device, wet mopping, wrapping and/or bagging of debris, using vacuum equipped tools, etc. Area is to be inspected and approved as clean by IPCS.
  - .5 Transportation of Equipment and Supplies: Prior to construction, IPCS, the *Consultants*, and the *Contractor* will establish delivery paths, time and procedures for the transportation of trade carts, equipment, materials, and "clean" install equipment. Movements and storage of equipment and supplies through the hospital may include but is not limited to:
    - .1 Daily maintenance of all trade carts so that they are kept in a clean and dust free condition.
    - .2 Daily wipe down of all trade carts with an approved "hospital disinfectant".
    - .3 Trade or supply carts of raw wood are NOT permitted. Exterior wood must be sealed to sustained daily cleaning and disinfection.
    - .4 Washdown of all waste carts after the disposal of any wastes and before the cart returns to the hospital.
    - .5 Removal of all packaging material from "final install" equipment prior to delivery through the hospital. *Contractor* will consult with the IPCS or designate on packaging necessary to protect devices prior to final install.
    - .6 Packaging materials permitted onto the construction site must be removed daily or as generated, whichever is more frequent.
    - .7 Transportation of equipment, materials/supplies and wastes is only permitted between the hours of 8:00am and 5:00pm. *Owner* or designate may grant limited exceptions in writing.
    - .8 Incoming construction material must be handled in accordance with CSA 317.13-07. Materials must be protected from moisture and dirt.
    - .9 Oversized "new install" equipment must be delivered in accordance with measures outlined by the IPCS or designate. Procedures may include but is not limited to additional cleaning of "new equipment", cleaning of the hoarding to permit clear passage into the work area followed by immediate reinstatement of the hoarding.
  - .6 Surveillance: IPCS or designate will determine frequency of site reviews of the construction area. Site review may include but is not limited to assessing the area for cleanliness and dust mitigation, worker compliance with measures as outlined, hospital approved workers/trades, etc.

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- .1 Security – site will have controlled access with appropriate signage to identify the area as a construction area and danger within.
  - .2 Security – access to site will be through a self closing door that is locked at the conclusion of each day's activity. Keys to the site will be provided to the IPCS or the *Owner*.
  - .3 *Contractor* will conduct daily site reviews and document daily findings in a log book as specified by the IPCS or designate.
  - .4 Site cleaner will document frequency of cleaning as specified by the IPCS or designate.
  - .7 Ventilation System and Negative Pressure Differential:
    - .1 Areas where work is being undertaken shall be isolated from occupied areas of the hospital using dust tight partitions and enclosures as described above.
    - .2 The *Place of the Work* will be maintained under negative pressure at all times in relation to the occupied areas of the existing building to prevent dust and airborne pathogens from entering the occupied areas of the existing building.
    - .3 Negative pressure shall be achieved through the use of dedicated (window or otherwise) exhaust units or, if direct access cannot be achieved, by HEPA filtered recirculation units that transfer filtered air from the *Place of the Work* into the occupied areas. Exhaust points will be reviewed with the *Owner* and the *Consultant* to ensure that the exhaust air from the *Place of the Work* is not affecting pedestrian routes and is not re-entrained back into the existing building through fresh air intakes.
    - .4 Provide construction exhaust/HEPA units and remove at the completion of the *Work*.
    - .5 Air systems serving only the *Place of the Work* will be shut down and all supply, return and exhaust openings shall be sealed to prevent dust and construction debris from entering the air system. As a further precaution, the air system will be reviewed at the end of the *Work* to determine if cleaning is required.
    - .6 Supply and return air ducts entering the *Place of the Work* are to be fitted with a pre-filter unit and sealed within the *Place of the Work* near point of entry or exit prior to the start of disruptive activity to prevent dust and construction debris from entering the air system. As a further precaution, the air system will be reviewed at the end of the *Work* to determine if cleaning is required.
    - .7 During construction, the seal only on the supply air duct may be removed after demolition and clean-up to permit ventilation within the construction area provided no other means is available.
    - .8 Areas adversely affected by changes in air flows outside the construction areas are to be re-balanced to comfortable levels as advised by the *Consultant*.
    - .9 Main HVAC infrastructure shall be protected from contamination in accordance with CSA Z317.02-01 Special Requirements for HVAC in Health Care Facilities, and CSA Z317.13-07.
  - .8 *Contractor* shall, when constructing the hoarding, install a magnehelic gauge that will measure negative pressure within the hoarded dust-down vestibule. *Contractor* shall take daily log of the readings of the gauge and record measurements in a report. Report shall be updated daily be available to the *Consultant* and *Owner* immediately upon request.
  - .9 *Contractor* shall ensure that vacuuming and cleaning of *Contractors* and *Subcontractors* clothes is mandatory prior to leaving areas of the *Work* to prevent dispersion of dust.
  - .10 *Contractor* to *Provide* their own mobile negative pressure enclosures in adequate numbers to align with the project schedule to do localized ceiling work. Use of *Owner's* mobile negative pressure enclosures is not permitted.

APPENDIX A – ICRA Risk Assessment and Preventive Measures

Refer to appendix A, consisting of 8 pages following this section.

APPENDIX B – IPAC Monitoring Checklist

Refer to appendix B, consisting of 2 pages following this section.

APPENDIX C – Patient Care Manual

Refer to appendix C, consisting of 10 pages following this section.

APPENDIX D – Mould Response Policy

Refer to appendix D, consisting of 1 page following this section.

APPENDIX E – IPAC Sign-off Sheet

Refer to appendix E, consisting of 1 page following this section.

**END OF SECTION**



**Appendix A:  
 Infection Prevention and Control Risk Assessment and Preventive Measures Checklist for Health Care Facility  
 Construction & Renovation**

Construction/Renovation Project Name/Identifier	Palliative Care Unit, K Wing, 1 <sup>st</sup> Floor		
Project Manager and Contact Number	Ray Annette – 416-480-6100 ext. 7345		
Infection Prevention and Control Representative and Contact Number	Dariusz Pajak – 416-480-6100 ext. 2301		
Contractor(s)	TBA		
Contractor’s Contact Information	TBA		
Construction Activity Type	Type D	Population Risk Group	Group 2
Matrix Value	IV	Proposed Project Start Date	08/2018

**Part One:** Types of Construction Activity

DEFINITIONS OF CONSTRUCTION ACTIVITY	
<b>Type A</b>	<b>Inspections and General Upkeep Activities.</b> Includes but is not limited to: removal of ceiling tiles for visual inspection (limited to 1 tile per 50 square feet); painting (but not sanding); installation of wall covering; electrical trim work; minor plumbing; and activities, which do not generate dust or require cutting into walls or access to ceilings other than for visual inspection
<b>Type B</b>	<b>Small scale, short duration activities, which create minimal dust.</b> Includes, but is not limited to, installation of telephone and computer cabling, access to chase spaces, cutting into walls or ceiling where dust migration can be controlled.
<b>Type C</b>	<b>Any work that generates a moderate to high level of dust.</b> Includes, but is not limited to, demolition or removal of built-in building components or assemblies, sanding of wall for painting or wall covering, removal of floor covering/wallpaper, ceiling tiles and casework, new wall construction, minor ductwork or electrical work above ceilings, major cabling activities.
<b>Type D</b>	<b>Major demolition and construction projects.</b> Includes, but is not limited to, heavy demolition, removal of a complete ceiling system, and new construction.

**Part Two:** Classification of Population Risk Group

POPULATION RISK GROUP BREAKDOWN			
GROUP 1 LOW	GROUP 2 MEDIUM	GROUP 3 MEDIUM to HIGH	GROUP 4 HIGHEST
<ul style="list-style-type: none"> <li>Private/Office areas</li> <li>Areas operating outside or void of patient care</li> </ul>	<ul style="list-style-type: none"> <li>Patient Care areas not identified in Group 3 or 4</li> <li>Laundry</li> <li>Cafeteria</li> <li>Dietary</li> <li>Materials Management</li> <li>PT/OT/Speech</li> <li>Admission/Discharge</li> <li>Echocardiography Laboratories not specified as Group 3</li> <li>Public Corridors through which patients, supplies, linen pass)</li> </ul>	<ul style="list-style-type: none"> <li>Emergency Rooms</li> <li>Radiology/Medical Imaging</li> <li>Post-anaesthesia Care units or Same Day Surgery (MG, M2)</li> <li>Labour and Delivery</li> <li>Newborn Nurseries</li> <li>Medical laboratories (Microbiology (B1), Transfusion Science (B2), Chemistry (CG), Pathology (E4, M2, B1), Haematology lab (CG), etc.)</li> <li>Post Surgical/Trauma Patient Care Units (D5, C5, D3, D6, C4)</li> <li>Oncology Units (C2, C3, C6)</li> <li>General Medicine Units (D2, D4, B4)</li> </ul>	<ul style="list-style-type: none"> <li>Ross Tilley Burn Centre (D7)</li> <li>Critical Care Unit (M2)</li> <li>Cardiovascular Intensive Care Unit (M2)</li> <li>B5 Intensive Care Unit</li> <li>Operating rooms (M2/D7/MG)</li> <li>Central Processing Department</li> <li>Newborn Intensive Care Unit</li> <li>Pharmacy Admixture</li> <li>Cardiovascular Care Unit (B3)</li> <li>Cardiac Catheterization Suites (C3)</li> </ul>

**Part Three:** Construction Activity and Risk Group Matrix

A copy of the Risk Assessment and Preventive Measures Checklist must be sent to the Infection Prevention and Control Department to determine the matrix and determine the preventive measures required Adaptations to the prevention measures can only be made after approval has been provided by the infection control personnel.

Risk Group	Construction/Renovation/Maintenance Activity			
	Type A	Type B	Type C	Type D
Group 1	I	II	II	III/IV
Group 2	I	II	III	IV
Group 3	I	III	III/IV	IV
Group 4	I-III	III/IV	III/IV	IV

.1

**Part D: Recommendations for Infection Control Preventive Measures**

**Matrix Class I Requirements**

**1a) C/R Activities - Dust Control**

1. After visual inspection replace displaced tiles and close access panels
2. Work area HEPA vacuumed if dust created during activity
3. Ensure that patient care equipment and supplies are protected from dust exposure by removal from space by hospital staff or by covering with a drop sheet

**1b) C/R Activities - Plumbing**

4. Schedule water interruptions during periods of low user activity
5. Faucet aerators, gaskets and items made of materials that support the growth of *Legionella* are not installed or used
6. Water temperature meets standards set by *Sunnybrook Health Sciences Centre*
7. Any discoloured water or water leaks to walls and substructures reported to maintenance and IP&C representative
8. Water lines flushed prior to re-use

### Matrix Class II Requirements

#### IIa) C/R Activities - Dust Control

1. All contractors and subcontractors must follow the assigned traffic route to and from the C/R zone
2. After visual inspection replace displaced tiles and close access panels
3. Active means provided to minimize dust generated and migrated into the atmosphere
4. Use drop sheets and water misting during cutting to control dust
5. Seal windows, unused doors, plumbing penetrations, electrical outlets and any other potential air leaks within C/R zone
6. Ensure that patient care equipment and supplies are protected from dust exposure by removal from space by hospital staff or by covering with a drop sheet
7. Debris removed from C/R zone in covered containers or covered with moistened sheet before transport
8. Work area wet mopped or HEPA vacuumed if dust created during activity and at completion of project
9. Horizontal and vertical surfaces to be cleaned with a hospital approved disinfect at completion of project prior to turnover to user group

#### IIb) C/R Activities – HVAC

10. Ventilation system disabled in the C/R area until project completed (where possible)
11. Need to change and/or clean filters in C/R area monitored
12. Air intake and exhaust vents in C/R zone sealed off with polyethylene

#### IIc) C/R Activities - Plumbing

13. Schedule water interruptions during periods of low user activity
14. Faucet aerators, gaskets and items made of materials that support the growth of *Legionella* are not installed or used
15. Water temperature meets standards set by *Sunnybrook Health Sciences Centre*
16. Any discoloured water or water leaks to walls and substructures reported to maintenance and IP&C representative
17. Hyper-chlorinate or superheat stagnant domestic water and flush water lines in C/R zone and adjacent patient areas before re-use

### Matrix Class III Requirements

#### IIIa) C/R Activities – Dust Control

1. IP&C consultation completed and IP&C dust control measures approved
2. Impermeable solid dust barrier, from true ceiling to floor erected and inspected by IP&C before start of project (drywall/sheetrock/gypsum board)
3. Double layer of 6 mil fire retardant polyethylene is an alternative dust barrier, but IP&C must be consulted to determine optimal choice based on location, type and duration of project
4. Upper seals must be installed above the false ceiling to the true ceiling around all penetrations to complete the dust barrier
5. Sticky mat placed and maintained outside C/R zone to trap dust from workers shoes, equipment and debris that leaves the C/R zone
6. Contractors vacuum themselves with HEPA-filtered vacuum before leaving work site (alternatively contractors can wear cloth/paper coveralls that are removed each time they leave the work site)
7. Use drop sheets and water misting during cutting to minimize dust generated and migrated into the atmosphere
8. Seal windows, unused doors, plumbing penetrations, electrical outlets and any other potential air leaks within C/R zone
9. Ensure that patient care equipment and supplies are protected from dust exposure by removal from space by hospital staff or by covering with a drop sheet
10. Debris removed from C/R zone in covered containers or covered with moistened sheet before transport
11. Work area wet mopped or HEPA vacuumed if dust created during activity and at completion of project
12. Horizontal and vertical surfaces to be cleaned with a hospital approved disinfect at completion of project prior to turnover to user group
13. Holes in walls repaired within 8 hours or temporarily sealed
14. Dust barrier shall remain in place until project complete, area has been thoroughly cleaned and inspected by IP&C
15. Dust barriers removed carefully to minimize the spreading of dust and other debris particles associated with the C/R project

#### IIIb) C/R Activities – HVAC

16. High-Efficiency Particulate Filters (HEPA) shall be used to obtain a negative pressure differential.  
Contractor responsible for providing appropriate number of units based on square footage of C/R zone
17. Filters shall be monitored and replaced if clogged or functioning below the manufacturer's specifications
18. Negative pressure differential with respect to adjacent areas is no less than 7.5 Pa (0.03 in wc)

19. Intake and exhaust vents/grills within C/R zone to be sealed off with poly for the duration of the project
20. Where possible air is to be exhausted directly outside and way from intake vents, alternatively air is to be filtered through HEPA filter before being re-circulated
21. Ventilation systems working properly in adjacent areas
22. Ventilation system is cleaned if contaminated by soil, water or dust after C/R project completion

### IIIc) C/R Activities – Plumbing

23. An alternate source of potable water must be provided for users during prolonged plumbing shutdowns and/or after major plumbing installation/repairs until potable water has been cleared for signs of *Legionella*
24. Schedule water interruptions during periods of low user activity
25. Faucet aerators, gaskets and items made of materials that support the growth of *Legionella* are not installed or used
26. Water temperature meets standards set by *Sunnybrook Health Sciences Centre*
27. Any discoloured water or water leaks to walls and substructures reported to maintenance and IP&C representative
28. Hyper-chlorinate or superheat stagnant domestic water and flush water lines in C/R zone and adjacent patient areas before re-use

### IIID) C/R Activities – Risk Reduction

29. High risk patients in/adjacent to C/R areas moved
30. Cleaning frequency of areas adjacent to C/R zone by cleaning by Hospital Environmental Services to be increased while project is underway
31. Traffic pattern designated for clean or sterile supplies and equipment that avoids C/R zone
32. Hospital medical allied health staff are not permitted to enter to then C/R zone for the duration of the project

### Matrix Class IV Requirements

#### IVa) C/R Activities – Dust Control

1. IP&C consultation completed and IP&C dust control measures approved
2. Impermeable solid dust barrier with anteroom erected and inspected by IP&C before start of project
3. Upper seals must be installed above the false ceiling to the true ceiling around all penetrations to complete the dust barrier
4. Sticky mat placed and maintained fresh outside and inside anteroom to trap dust from workers shoes, equipment and debris that leaves the C/R zone
5. Construction workers leave C/R zone through anteroom to be vacuumed with HEPA-filtered vacuum before leaving work site (alternatively contractors can wear cloth/paper coveralls that are removed each time they leave the work site)
6. Impermeable solid dust barrier, from true ceiling to floor erected and inspected by IP&C before start of project (drywall/sheetrock/gypsum board)
7. Use drop sheets and water misting during cutting to minimize dust generated and migrated into the atmosphere
8. Seal windows, unused doors, plumbing penetrations, electrical outlets and any other potential air leaks within C/R zone
9. Ensure that patient care equipment and supplies are protected from dust exposure by removal from space by hospital staff or by covering with a drop sheet
10. Debris removed from C/R zone in covered containers or covered with moistened sheet before transport
11. Work area wet mopped or HEPA vacuumed if dust created during activity and at completion of project
12. Horizontal and vertical surfaces to be cleaned with a hospital approved disinfect at completion of project prior to turnover to user group
13. Holes in walls repaired within 8 hours or temporarily sealed
14. Dust barrier to remain in place until project complete, area has been thoroughly cleaned and inspected by IP&C
15. Dust barriers removed carefully to minimize the spreading of dust and other debris particles associated with the C/R project

#### IVb) C/R Activities – HVAC

16. High-Efficiency Particulate Filters (HEPA) shall be used to obtain a negative pressure differential. Contractor responsible for providing appropriate number of units based on square footage of C/R zone
17. Filters shall be monitored and replaced if clogged or functioning below the manufacturer's specifications
18. Negative pressure differential with respect to adjacent areas is to be maintained no less than 7.5 Pa (0.03 in wc)

19. Intake and exhaust vents/grills within C/R zone to be sealed off with poly for the duration of the project
20. Where possible air is to be exhausted directly outside and way from intake vents, alternatively air is to be filtered through HEPA filter before being re-circulated
21. Ventilation systems working properly in adjacent areas
22. Ventilation system is cleaned if contaminated by soil, water or dust after C/R project completion

#### **IVc) C/R Activities – Plumbing**

23. An alternate source of potable water must be provided for users during prolonged plumbing shutdowns and/or after major plumbing installation/repairs until potable water has been cleared for signs of *Legionella*
24. Schedule water interruptions during periods of low user activity
25. Faucet aerators, gaskets and items made of materials that support the growth of *Legionella* are not installed or used
26. Water temperature meets standards set by *Sunnybrook Health Sciences Centre*
27. Any discoloured water or water leaks to walls and substructures reported to maintenance and IP&C representative
28. Hyper-chlorinate or superheat stagnant domestic water and flush water lines in C/R zone and adjacent patient areas before re-use

#### **IVd) C/R Activities – Risk Reduction**

29. High risk patients in/adjacent to C/R areas moved
30. Cleaning frequency of areas adjacent to C/R zone by cleaning by Hospital Environmental Services to be increased while project is underway
31. Traffic pattern designated for clean or sterile supplies and equipment that avoids C/R zone
32. Hospital medical and/or allied health staff are not permitted to enter to then C/R zone for the duration of the project



**Date:** \_\_\_\_\_ **Time:** \_\_\_\_\_

**Location:** \_\_\_\_\_ **Inspector:** \_\_\_\_\_

**Construction/Renovation/Repair site has been checked for:**

ITEM	COMPLIANCE?		
	Y	N	N/A
<b>1. Construction Barriers</b>	Y	N	N/A
Infection Control Permit/Sign off posted outside work area			
Airtight plastic or drywall barriers extend from floor to ceiling			
All airtight penetrations sealed with heavy tape			
All remaining hospital equipment, doors, holes, conduits, unused windows, outlets in work area covered with poly and sealed			
Doors to anteroom and work site remain securely closed			
Upper seals intact			
Portable containment cube intact, labeled and completely sealed			
Portable HEPA vacuum or HEPA filtration unit attached outside cube and turned on during ceiling/wall access			
<b>2. Negative Air</b>	Y	N	N/A
HVAC system has been isolated to prevent contamination of the duct system. Supply vents are blocked and return vents are filtered			
Equipment to prevent airborne particulates from escaping work area are used appropriately (e.g. portable HEPA filter units/filtered vacuums, exhaust fans)			
Doors to anteroom and work site remain securely closed			
Portable HEPA filtration unit is well secured (clamped hose) and ducted properly			
Work site is at negative pressure to surrounding areas (0.03kpa)			

Contractors properly attired (coveralls/booties put on over clothing) prior to entering work zone			
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<b>3. CLEANLINESS OF AREA</b>	<b>Y</b>	<b>N</b>	<b>N/A</b>
Protective clothing properly removed and disposed of, or existing clothing properly vacuumed in ante-room prior to leaving work area			
Sticky mats or adhesive strips are clean and available at doorways for shoe dust collection			
No visible dust or footprints outside of work zone			
Anteroom is intact and free of debris/dust			
Sticky mats are fresh and available at doorways for dust collection			
Construction area cleaned daily.			
Demonstrated compliance with traffic patterns, both construction worker and supply/debris removal.			

<p><b><i>COMMENTS/NOTES</i></b></p> <hr/> <hr/> <hr/> <hr/> <hr/>
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- Any major deficiencies should be addressed immediately. Non-compliance should be brought to the attention of the Project Manager (refer to Infection Control Risk Assessment Tool)
- This monitor checklist will be completed periodically for the duration of the construction/renovation/repair project
- A corrective action log for documented non-compliance will be maintained by Infection Prevention and Control

## Appendix C: Patient Care Manual

### Policy Statement:

It is Sunnybrook & Women's Policy to ensure that each construction and/or renovation project's design and process meet current infection control standards and will be reviewed to:

1. Design state of the art infection prevention systems.
2. Determine the risks to patients, visitors, staff, volunteers, students, and contractors throughout the pre- construction, construction and post-construction phases and proactively initiate prevention strategies.
3. Support Infection Prevention & Control Service (IPCS) to investigate and advise on the risks of organisms that exist in the project area.

The goal is to eliminate any infectious risks where possible and minimize those risks that cannot be eliminated.

### Definition(s):

#### Project Manager (PM):

The lead representative of Corporate Planning & Development, Facilities Services and Others, responsible for the maintenance, construction or renovation projects.

The Project Manager has a key role to help prevent outbreaks due to Aspergillosis and Legionellosis by planning and employing appropriate infection prevention and control interventions before and during construction and renovation. Environmental Service also has an important role to keep the construction area clean when the responsibility for area cleanliness is not under the construction contract.

1. The Project Manager will advise IPCS of any scheduled construction and renovation projects.
2. IPCS is to be included in the design and construction process. The Project Manager, in conjunction with IPCS, is responsible for ensuring that the contractors carry out infection prevention activities.
3. The construction and renovation Infection Control Checklist is to be completed for all projects by IPCS and a copy forwarded to the Project Manager during the initial stages of the project. The checklist also notes areas where IPCS input is not needed (e.g. Class 1-11 activity). Projects needing special notification include breaching ceilings, walls, floors, and ventilation/air handling systems. The installation of wiring in patient care areas also constitutes a breach of ceiling integrity and warrants barrier precautions.

#### Project Team:

This includes the Project Manager, IPCS, Project Consultants, User Group and other Department representatives including Facilities Services as determined at project start-up.

#### Procedure:

IPCS and hospital administration will liaise with the appropriate staff from the department Unit to determine the infection risks to patients, visitors and hospital staff. IPCS will sign-off the plans for each project.

#### 1. Design:

- Design Phase: Notify IPCS of impending construction/renovation plans. IPCS will provide expertise related to the design of the area to optimize infection prevention and control practices during the functional programming process.
- During the design phase IPCS will assess the risks related to the project utilizing the Risk Assessment and Preventive Measures Checklist (**Appendix I R**). The determination of risk

will guide the need for barriers during the construction/renovation project. The Project Manager or delegate will communicate the assessment to the design team.

- Facilities Services will review preventative maintenance requirements during design to ensure that any costs are incorporated into the appropriate budgets.

## 2. Pre-construction:

The Project Team will work with IPCS to address the following:

- general information on infection prevention measures
- patient populations that may be at risk
- prevention measures for essential services (e.g. water, ventilation systems, electricity) that may be disrupted
- the integrity of the facility's exterior structure, spatial separations, ventilation and water supplies for any infection control problems
- methods for dust containment and removal of construction debris
- traffic patterns for construction workers and supply delivery routes will be established to minimize risks to patients, staff and visitors
- the need for increased filter changes during construction
- the need to close down dampers temporarily to reduce circulation of contaminated air or fumes
- that the systems can provide the correct air exchange rates and pressure relationships in critical areas near construction activity
- IPCS/Occupational Health & Safety (OHS) may at the request of the project team attend OHS meetings for IPCS/OHS procedure overviews.

### Construction:

Breaches in agreed to infection prevention measures, as outlined in **Appendix I R** and completed in Phase 1 that place staff and/or patients at risk will result in "stop" construction orders to the Project Manager by Infection Prevention & Control Service.

### Patients:

Immune suppressed patients (e.g. Oncology patients, neonates, dialysis, and burn patients) must be moved to an area away from the construction zone if air quality cannot be ensured during construction/renovation activity. Avoid transporting any patient through the construction zone. If this must be done the patient must wear a high efficiency mask.

### Air Ventilation:

The Project Team will be responsible for addressing air and ventilation as categorized by IPCS within the initial stages of the project and as specified in **Appendix I R**

#### a) Cleaning

Cleaning will be provided as categorized by IPCS within the initial stages of the project and as specified in **Appendix I R**.

#### b) Construction Personnel

Protective clothing is to be removed when exiting through patient areas or vacuumed when exiting through other areas as categorized by IPCS within the initial stages of the project and as specified in **Appendix I R**.

#### c) Transportation of Equipment Supplies

Prior to construction, IPCS and the Project Team will establish paths and procedures for the transportation of clean/sterile supplies, equipment and construction materials, including the removal of construction debris.

### 3. Surveillance

IPCS personnel will enhance surveillance as appropriate.

Site review of the construction/renovation project will be conducted on a regular basis with the Project Manager, construction representative and IPCS. IPCS will provide written inspection report to the Project Manager as necessary.

### 4. Water and Ventilation Systems

The Project Team will be responsible for addressing air and ventilation as categorized by IPCS within the initial stages of the project and as specified in *Appendix I R*.

- a) The construction site will be maintained under negative pressure at all times in relation to the occupied areas of the Hospital to prevent dust and airborne pathogens from entering the occupied areas of the hospital. Negative pressure shall be achieved through the use of dedicated (window or otherwise) exhaust units or if direct cannot be achieved by Hepa filtered recirculation units which transfers filtered air from the construction site into the building exhaust system or occupied areas, as approved by the Hospital. Exhaust points will be reviewed to ensure that the exhaust air from the construction site is not affecting pedestrian routes and is not re-entrained back into the Hospital through fresh air intakes.
- b) Supply and return air ducts entering the defined construction zone are to be fitted with a pre-filter unit and sealed within the construction area near point of entry or exit prior to the start of disruptive activity to prevent dust and construction debris from entering the air system. As a further precaution, the air system will be reviewed at the end of the project to determine if cleaning is required.
- c) During construction the seal only on the supply air duct may be removed after demolition and construction clean-up as defined under *Appendix I R (Class III)* as required to permit ventilation within the construction area provided no other means is available.
- d) Areas adversely affected by changes in air flows outside the construction areas are to be re-balanced to comfortable levels as advised by the consultant.
- e) All areas deemed sensitive to airflow and designed with either negative or positive room pressurization (e.g. isolation rooms, OR, etc) must be equipped with an electronic monitor with local alarm.
- f) All Water systems must be thoroughly disinfected and flushed prior to occupancy.

#### Post-Construction:

##### a) Cleaning

In addition to the cleaning requirements as categorized by IPCS within the initial stages of the project and as specified in **Appendix I R**, the construction areas must also be cleaned prior to and at completion of work as follows;

- Construction cleaning prior to reopening a supply air duct during construction.
- Construction cleaning prior to the removal of any barriers.
- Construction cleaning after the removal of any barrier.
- Construction cleaning immediately after completion of minor work performed after

the removal of barriers.

- Final cleaning by Environmental Services prior to occupancy.
- Cleaning as required by Environmental Services during commissioning as required.
- Construction cleaning is defined as the complete removal of all debris and vacuuming the entire area with a HEPA filter unit. Area is to be inspected and approved as clean by IPCS.
- Final cleaning is defined as post construction cleaning as provided by the Hospital's workforce or contracted cleaning service.

**b) Inspection**

A site inspection of the construction/renovation area must be undertaken by IPCS and/or Project Manager prior to occupancy.

IPCS will provide written deficiencies in a timely fashion to allow patients use of the area.

**References:**

1. APIC Text of Infection Control and Epidemiology (2000). Chapter 72
2. Infection Control Tool Kit Series: Construction and Renovation. (1998-1999) APIC Education Committee
3. Construction-related Nosocomial Infections for Patients in Health Care Facilities: Decreasing the Risk of Aspergillus, Legionella and other Infections. July, 2001 Health Canada.
4. AIA Guidelines for Design and Construction of Hospital and Health Care Facilities. American Institute of Architects Press 2001. ISBN# 1-55835-151-5

**Risk Assessment and Preventive Measures Checklist for Health Care Facility Construction and Renovation**

Location of Construction:		Project Start Date:		Estimated Duration:		
Project Manager (PM):		Contractor(s):		Infection control professional (ICP):		
PM's phone number:		Contractor's phone number:		ICP's phone number:		
Yes	No	Construction Activity (See Part A)		Yes	No	Population Risk Group (See Part B)
		Type A: Inspection, non-invasive activities.				Group 1: Lowest Risk
		Type B: Small scale, short duration, minimal dust generating activities				Group 2: Medium Risk
		Type C: Activities that generate moderate to high levels of dust, requires greater than one work shift to complete.				Group 3: Medium to High Risk
		Type D: Activities that generate high levels of dust, major demolition and construction activities requiring consecutive work shifts to complete.				Group 4: Highest Risk

**Part A: Types of Construction Activity**

Type A	<p>Inspection and Non-invasive Activities: These include, but are not limited to, activities that require removal of ceiling tiles for visual inspection (limited to 1 tile per 50 square feet), painting (but not sanding), wall covering, electrical trim work, minor plumbing (disrupts water supply to a localized patient care area.</p> <p>[e.g., 1 room] for less than 15 minutes), and other maintenance activities that do not generate dust or require cutting of walls or access to ceilings other than for visual inspection.</p>
Type B	<p>Small scale, short duration activities that create minimal dust. These include, but are not limited to, activities that require access to chase spaces, cutting of walls or ceilings where dust migration can be controlled for the installation/repairs of minor electrical work, ventilation components, telephone wires or computer cables, and sanding of walls for painting or wall covering to only repair small patches. It also includes plumbing that requires disruption to the water supply of more than one patient care area (e.g., &gt; 2 rooms) for less than 30 minutes.</p>
Type C	<p>Any work that generates a moderate to high level of dust or requires demolition or removal of any fixed building components or assemblies (e.g. counter tops, cupboards, sinks). These include, but are not limited to, activities that require sanding of walls for painting or wall covering, removal of floor coverings, ceiling tiles and casework, new wall construction, minor duct work or electrical work above ceilings, major cabling activities, and any activity that cannot be completed within a single work shift. It also includes plumbing that requires disruption to the water supply of more than one patient care area (e.g. &gt; 2 rooms) for more than 30 minutes but less than 1 hour.</p>
Type D	<p>Major demolition, construction and renovation projects. These include, but are not limited to, activities that involve heavy demolition or removal of a complete cabling system and new construction that requires consecutive work shifts to complete. It also includes plumbing that results in disruption to the water supply of more than one patient care area (e.g. &gt; 2 rooms) for more than 1 hour.</p>



**Part B: Population and Geographical Risks Group**

Group 1 Lowest Risk	Group 2 Medium Risk	Group 3 Medium to High Risk	Group 4 Highest Risk
<ul style="list-style-type: none"> <li>• Office areas</li> <li>• Unoccupied wards</li> <li>• Public areas</li> </ul>	<ul style="list-style-type: none"> <li>• All other patient care areas (e.g. cardiac rehab, ambulatory care clinics unless stated in Group 3 or 4)</li> <li>• Outpatient clinics (except for oncology &amp; surgery)</li> <li>• Admission/discharge units</li> </ul>	<ul style="list-style-type: none"> <li>• Emergency room</li> <li>• Radiology/MR I</li> <li>• Post anesthesia care units</li> <li>• Labour and delivery (non OR)</li> <li>• Normal newborn nurseries</li> <li>• Day surgery</li> <li>• Nuclear medicine</li> <li>• Physiotherapy tank areas</li> <li>• Echocardiography</li> <li>• Pump team</li> <li>• Laboratories (specimens)</li> <li>• General med/surg.wards other than those listed in Group 4</li> <li>• Pediatrics</li> <li>• Geriatrics</li> <li>• Long-term care</li> </ul>	<ul style="list-style-type: none"> <li>• All ICUs</li> <li>• All ORs</li> <li>• Oncology units and outpatient clinics for patients with cancer</li> <li>• Transplant units and outpatient who have received bone marrow or solid organ transplants</li> <li>• Wards and out-patient clinics for patients with AIDS or other immunodeficiency</li> <li>• Dialysis units</li> <li>• Tertiary care nurseries</li> <li>• Labour &amp; delivery operating rooms</li> <li>• All cardiac cauterization &amp; angiography areas</li> <li>• Cardiovascular / cardiology patients</li> <li>• Anesthesia and pump areas</li> <li>• All endoscopy areas</li> <li>• Pharmacy admixture rooms</li> <li>• Sterile processing rooms</li> <li>• Central Processing Dept.</li> </ul>

**Part C: Construction Activity and Risk Group Matrix**

A copy of the Risk Assessment and Preventive Measures Checklist must be sent to the Infection Prevention and Control Department when the matrix indicates that Class III and/or Class IV preventive measures are required (see shaded areas). Adaptations to the prevention measures can only be made after approval has been provided by the infection control professional. Infection control personnel should also be consulted when construction activities need to be done on hallways adjacent to Class III and Class IV areas.

Construction Activity				
Risk Group	Type A	Type B	Type C	Type D
Group 1	I	II	III	IV
Group 2	I	II	III	IV
Group 3	I	III	III / IV	IV
Group 4	I- III Contact IPCS to ensure it is Class I	III / IV	III / IV	IV

**Part D: Specifications for Infection Control Prevention Measures**

Class I	Engineer / Maintenance Staff and Contractors	Environmental Services
	a) Construction/Renovation Activities Dust Control* <ul style="list-style-type: none"> <li>• Immediately replace tiles displaced for visual inspection</li> <li>• Vacuum work area</li> </ul> b) Plumbing Activities <ul style="list-style-type: none"> <li>• Schedule water interruptions during low activity (e.g., evenings if at all possible)</li> <li>• Flush water lines prior to reuse</li> <li>• Observe for discolored water</li> <li>• Ensure water temperature meets the standards set by the health care facility</li> <li>• Ensure gaskets and items made of materials that support the growth of Legionella are not being used</li> <li>• Ensure faucet aerators are not installed or used</li> <li>• Maintain as dry an environment as possible and report any water leaks that occur to walls and substructures</li> </ul>	a) Plumbing Activities <ul style="list-style-type: none"> <li>• Report discolored water and water leaks to maintenance and ICP</li> </ul> Medical/Nursing Staff a) Construction/Renovation Activities Risk Reduction <ul style="list-style-type: none"> <li>• Minimize patients exposure to construction/renovation area</li> </ul> b) Plumbing Activities <ul style="list-style-type: none"> <li>• Report discolored water and water leaks to maintenance and ICP</li> </ul>

Note: Class II specifications must be followed if dust should be created during the Type A construction activity.

Class II	Engineer / Maintenance Staff and Contractors	Environmental Services
	a) Construction/Renovation Activities Dust Control <ul style="list-style-type: none"> <li>• Execute work by methods to minimize dust generation from construction or renovation activities</li> <li>• Wet mop and/or vacuum as necessary</li> <li>• Provide active means to minimize dust generation and migration into the atmosphere</li> <li>• Use drop sheets to control dust</li> <li>• Control dust by water misting work surfaces while cutting</li> <li>• Seal windows and unused doors with duct tape</li> <li>• Seal air vents in construction/renovation area</li> <li>• Place dust mat at entrance to and exit from work areas</li> </ul> Ventilation <ul style="list-style-type: none"> <li>• Disable the ventilation system in the construction/renovation area until the project is completed</li> <li>• Monitor need to change and/or clean filters in construction or renovation area</li> </ul> Debris Removal & Cleanup <ul style="list-style-type: none"> <li>• Contain debris in covered containers or cover with a moistened sheet before for disposal</li> </ul> b) Plumbing Activities <ul style="list-style-type: none"> <li>• Collection tanks and long pipes that allow water to stagnate should be avoided</li> <li>• Consider hyper chlorinating or superheating stagnant potable water (especially if Legionella is already present in potable water supply)</li> </ul>	a) Construction/Renovation Activities Dust Control <ul style="list-style-type: none"> <li>• Wet mop and vacuum area with a HEPA filtered vacuum as needed and when work is completed</li> <li>• Wipe horizontal work surfaces with a disinfectant</li> </ul> Medical/Nursing Staff a) Construction/Renovation Activities Risk Reduction <ul style="list-style-type: none"> <li>• Identify high risk patients who may need to be temporarily moved away from the construction zone</li> </ul>

Class IV	Engineer / Maintenance Staff and Contractors	Environmental Services
	<p>a) Construction/Renovation Activities Dust Control</p> <ul style="list-style-type: none"> <li>• Before starting the construction project erect an impermeable dust barrier that also has an anteroom</li> <li>• Place a walk-off mat outside the anteroom in patient care areas and inside the anteroom to trap dust from the workers shoes, equipment and debris that leaves the construction zone</li> <li>• Construction workers should leave the construction zone through the anteroom so they can be vacuumed with a 1 HEPA filtered vacuum cleaner before leaving the work site; or they could wear cloth or paper coveralls that are removed each time they leave the work site</li> <li>• All personnel entering the construction zone are required to wear shoe covers</li> <li>• The construction workers must change the shoe covers each time they leave the work site</li> <li>• Holes in walls should be repaired within 8 hours or be temporarily sealed</li> </ul> <p>Ventilation</p> <ul style="list-style-type: none"> <li>• Ensure negative pressure is maintained within the anteroom and construction zone</li> <li>• Ensure ventilation systems are working properly in adjacent areas</li> <li>• Review ventilation system requirements in the construction area with IPCS to ensure system is appropriate and is functioning properly Evaluation</li> <li>• Review infection control measures with other members of the planning team or delegate to evaluate their effectiveness and identify problems at the end of construction project</li> </ul> <p>b) Plumbing Activities</p> <ul style="list-style-type: none"> <li>• If there are concerns about legionella, consider hyper chlorinating stagnant potable water or superheating and flushing all distal sites before restoring or re-pressurizing the water system</li> </ul>	<p>a) Construction/ Renovation Activities Evaluation</p> <ul style="list-style-type: none"> <li>• Review infection control measures with other members of the planning team or delegate to evaluate their effectiveness and identify problems at the end of construction project</li> </ul> <p>Infection Control Personnel</p> <p>a) Construction/Renovation Activities Risk Reduction</p> <ul style="list-style-type: none"> <li>• Regularly visit the construction site to ensure preventive measures are being followed. Wear cover-alls and shoe covers when visiting the site.</li> </ul> <p>Evaluation</p> <ul style="list-style-type: none"> <li>• Review infection control measures with other members of the planning team or delegate to evaluate their effectiveness and identify problems at the end of construction project</li> </ul> <p>b) Plumbing Activities</p> <ul style="list-style-type: none"> <li>• If there are concerns about Legionella, consider hyper chlorinating stagnant potable water or superheating and flushing all distal sites before restoring or re-pressurizing the water system</li> </ul> <p>Medical /Nursing Staff</p> <p>Staff are not allowed to visit construction site.</p> <p>a) Construction/Renovation Activities Evaluation</p> <ul style="list-style-type: none"> <li>• Review infection control measures with other members of the planning team or delegate to evaluate their effectiveness and identify problems at the end of construction project</li> </ul> <p>b) Plumbing Activities</p> <ul style="list-style-type: none"> <li>• Consider using another source of potable water for patients who are at greatest risk until potable water has been cleared for signs of Legionella after major plumbing installation/repairs</li> </ul>

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## Appendix D: Infection Prevention and Control

**Title: Mould Response Policy (IP&C and OHS)      Policy No:      11-Q-1430**

### **Policy Statement:**

It is Sunnybrook & Women's Policy to establish procedures to ensure airborne mould is minimized through safe work practice. Procedures developed will assist to identify mould sites and the source, so that an appropriate plan of action can be put in place to assure the safety of our employees, patients and volunteers is maintained. Exposures will be kept to a minimal with respect to environmental pathogens such as moulds and other fungi. These environmental pathogens, such as *Aspergillus* and *Stachybotrys* can be harmful to patients with already compromised immune systems

### **Definition(S):**

**Fungus:** Any of a major group (Fungi) of saprophytic and parasitic spore-producing organisms usually classified as plants that lack chlorophyll and include moulds (filamentous fungi), rusts, mildews, smuts, mushrooms, and yeasts.

**Immune Compromised:** A reduced or lacking ability for the body to defend against pathogens (bacteria, virus, and fungi). Examples of immune compromised individuals include oncology patients, HIV/AIDS patients, dialysis patients, and patients in Intensive care units (ICU) (e.g. critical care unit, burn unit, neurosurgical ICU, Neonatal ICU, etc.).

**Mould:** A growth of filamentous fungi, with a portion growing into damp or decaying organic matter and a visible surface growth, which usually assumes a fluffy appearance. Examples of filamentous fungi include *Aspergillus* and *Stachybotrys*.

### **PROCEDURE: If Mould Is Suspected:**

1. For an affected area greater than 10 ft<sup>2</sup> Facilities Services is to contact Infection Prevention & Control (IP&C) and Occupational Health & Safety (OHS) for direction and confirmation of the presence of mould.
2. If the presence of mould is confirmed, the affected area is to be hoarded off with 2 layers of 6 mil polyethylene sheeting. This is to prevent any further dissemination of fungal spores.
3. If the presence of mould is confirmed, and the affected area is a ceiling tile or is less than 10 ft<sup>2</sup> (Small-Scale), Facilities Services may remediate the mould following appropriate standards.
4. If the presence of mould is confirmed and the affected area is greater than 10 ft<sup>2</sup>, Facilities Services (or Corporate Planning) must contact an external Mould Abatement Contractor. The abatement must follow appropriate remediation standards.
5. Project Manager or Project Lead must retain an incident report in the building mould record and forward copies to IPC and OHS.

### **References:**

1. Mould guidelines for the Canadian construction industry. Canadian Construction Association, 2004
2. Guidelines for the investigation, assessment and remediation of mould in workplaces. Workplace Safety and Health Division, Manitoba Department of Labour & Immigration, March 2001
3. Fungal contamination in public buildings: A guide to recognition and management. Federal-Provincial Committee on Environmental and Occupational Health, Health Canada, June 1995
4. Mold Remediation in Schools and Commercial Buildings. U.S. Environmental Protection Agency, June 25 2001
5. Alert, Mould in Workplace Buildings, Ontario Ministry of Labour, Alert 20: ISSN 1195-5228, December 2000

# Appendix E

## Infection Control/Occupational Health and Safety Sign-off

Project Name/Location: \_\_\_\_\_

Project Manager: \_\_\_\_\_

Contractor: \_\_\_\_\_

**Initial sign-off (Infection Prevention and Control):**

Date: \_\_\_\_\_ Signature: \_\_\_\_\_

**Initial sign-off (Occupational Health and Safety):**

Date: \_\_\_\_\_ Signature: \_\_\_\_\_

*To be completed by IPC/OHS*

Date	Walk-off (sticky) mats in place and in good condition	Negative pressure of 7.5 Pa (0.03 in wc) continuously monitored	Containment is well sealed	Comments/Correction actions	Initials
	<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input type="radio"/> No		
	<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input type="radio"/> No		
	<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input type="radio"/> No		
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## PART 1 – GENERAL

### 1.1 GENERAL REQUIREMENTS

- .1 Read and be governed by conditions of the *Contract* and sections of Division 1.

### 1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- .1 Particular requirements for inspection and testing to be carried out by testing laboratory designated by *Consultant* are specified under various sections of the specifications.
- .2 Materials and workmanship quality, reference standards - under Section 01 60 00.
- .3 Balancing and testing of systems - under Divisions 21, 22, and 23 and Divisions 26, 27, and 28.

### 1.3 APPOINTMENT AND PAYMENT

- .1 From time to time during progress of the *Work*, the *Owner* will require that inspection and testing be performed to determine that materials *Provided* in the *Work* meet the requirements of the *Contract Documents*.
  - .1 *Subcontractors* shall verify with *Contractor*, in writing, portions of the *Work* that will require inspection and /or testing, prior to commencing such affected work.
- .2 The *Owner* will appoint inspection and testing companies, representing, reporting and responsible to the *Owner*. Cost of inspection and testing will be authorized as a disbursement from cash allowance as specified in Section 01 21 00 unless otherwise indicated or specified and except for the following:
  - .1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
  - .2 Inspection and testing performed exclusively for *Contractor's* convenience.
  - .3 Testing, adjusting and balancing of conveying systems, mechanical and electrical equipment and systems.
  - .4 Mill tests and certificates of compliance.
  - .5 Tests specified to be carried out by *Contractor* under the supervision of *Consultant*.
  - .6 Where tests or inspections by designated testing laboratory reveal work not in accordance with *Contract* requirements, *Contractor* shall pay costs for additional tests or inspections as *Consultant* may require to verify acceptability of corrected work.
  - .7 Additional testing required because of changes in materials, proportions of mixes requested by *Contractor* or *Subcontractors* as well as any extra testing of materials occasioned by lack of identification or by failure of such materials being replaced to meet requirements of the *Contract Documents* or testing of structure or elements including load testing, shall be carried out at no additional cost to the *Owner*.
  - .8 Where evidence exists that defective workmanship has occurred or that the *Work* has been carried out incorporating defective materials, the *Consultant* reserves the right to have tests, inspections or surveys performed, analytical calculation of structural strength made and the like in order to help determine the extent of defect and whether such work must be replaced. Tests, inspections or surveys carried out under these circumstances will be made at the *Contractor's* expense, and will not be paid by *Owner*.
  - .9 Testing and inspection and compliance letters specified in other sections.

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- .3 Inspection and testing company shall submit monthly invoice original to *Contractor* for review, relating invoices to tests and inspection reports. Provide original receipts for disbursements. Invoices will be forwarded by *Contractor* to *Consultant* for inclusion in progress payment application.
  - .4 The *Consultant* will appoint a *Commissioning* consultant to review the work of the Contract during closeout procedures. Payment of the *Commissioning* consultant's fees shall be made outside of this *Contract* and is not the *Contractor's* responsibility. The *Contractor* shall be responsible to correct all deficiencies as reported by the *Commissioning* consultant and in accordance with the *Contract Documents*. Refer to Sections 01 77 00 and 01 91 00 for additional closeout and *Commissioning* requirements.
  - .5 Inspection and testing shall be performed by qualified and/or certified personnel under professional supervision or performed directly by a professional engineer qualified in conformance with applicable codes and certification programs.
  - .6 Requirements of regulatory agencies:
    - .1 Testing shall be conducted in accordance with requirements of the building code.
    - .2 Obtain certification where required by the building code and standards.
  - .7 Cooperation with inspection and testing company:
    - .1 Provide inspection company with materials and installation information as required and /or requested.
    - .2 Provide access to the *Work* for representatives of inspection and testing companies.
    - .3 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.
    - .4 Cooperate with inspection and testing companies and give adequate notification of any changes in source of supply, additional work shifts and any other proposed changes.
    - .5 No *Product* nor part of the *Work* shall be installed before it is tested when a test is specified or required, nor shall work be executed where a test or inspection is required and the inspector cannot attend. Pay costs for uncovering and making good work that is covered before required inspection or testing is completed and approved by *Consultant*.
    - .6 Cooperate in permitting access to the *Work* for inspection and testing company wherever the *Work* is in progress, or wherever *Products*, materials, or equipment are stored prior to shipping.
    - .7 Supply labour required to assist inspection and testing company in sampling and making tests.
    - .8 Repair work damaged as a result of inspection and testing work.
    - .9 Cost of above labour and material shall be borne by applicable *Subcontractors*.
    - .10 The inspection and testing service does not relieve the *Contractor* of responsibility for normal shop and site inspection, and quality control of production.
    - .11 Pay costs for removal and replacement of *Work*, or for remedial measures necessitated by faulty workmanship and materials which fail to meet requirements specified.
  - .8 Prepare schedule for inspection and testing in accordance with Section 01 33 00 and as follows:
    - .1 Establishing schedule:
      - .1 By advance discussion with the selected testing laboratory, determine the time required for the laboratory to perform its tests and to issue each of its findings.
      - .2 Allow required time within Construction Schedule.
    - .2 Adherence to schedule:
      - .1 *Contractor* shall advise testing laboratory in advance when testing of the *Work* is required.

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- .2 When testing laboratory is ready to test according to predetermined schedule, but is prevented from testing or taking specimens due to incompleteness of the parts of the *Work* scheduled for inspection and testing, extra costs for testing attributable to the delay may be back-charged to *Contractor* at no increase in the *Contract Price*.
  - .3 Notify *Contractor* and inspection company at least 3 *Working Days* before work required to be inspected commences, and arrange for a meeting at the *Place of the Work*, to be held 1 *Working Day* before the work starts with the following present:
    - .1 *Contractor*, a principal of the *Subcontractor* whose work is to be inspected and/or tested, inspection and testing company, manufacturer's representative and *Consultant*.
  - .4 Give 2 *Working Days* prior notice to inspection company of the commencement of each phase of the *Work* requiring inspection, and provide inspection company with materials and installation information.
- .9 Reports and documents
- .1 Inspection and testing companies shall submit shop inspection and site inspection reports within 5 *Working Days* of each inspection.
  - .2 Distribute reports as follows:
    - .1 *Owner*; 2 copies
    - .2 *Consultant*; 1 copy.
    - .3 *Contractor*; 2 copies
    - .4 Consulting engineers, as applicable; 1 copy each.
  - .3 Inspectors shall submit a written report on each inspection or test, including pertinent data such as conditions at the *Place of the Work*, dates, test references, locations of tested materials, actual *Product* identification, procedures and descriptions, site instructions given, recommendations and/or any other information required by standard applicable to reporting of tests and inspections.
  - .4 Clearly indicate in report failure of *Product* or procedures to meet applicable standards, give recommendations for retesting or correction. Contact *Consultant* immediately when *Product* or procedure fails to meet applicable standards.
  - .5 Upon completion of those parts of the *Work* subject to independent inspection and testing, submit to the *Consultant* duplicate certificates of acceptance of the installation issued by the independent inspection and testing company.
- .10 Inspection and test specimens
- .1 Inspection and testing will, generally, consist of procedures listed in the following paragraphs, but additional tests may be performed as required to verify conformance to *Contract Documents*.
  - .2 Specimens and samples for testing, unless otherwise specified in the *Contract Documents*, will be taken by the testing laboratory; sampling equipment and personnel will be provided by the testing laboratory; and deliveries of specimens and samples to the testing laboratory will be performed by the testing laboratory.
  - .3 Inspection and testing company shall take samples necessary to verify quality as specified by applicable standards or as specified herein. Taking of samples shall not endanger the structure or life, and shall be taken so as to best represent the *Work* as a whole.



- .4 Samples shall be handled, packaged, stored and delivered so as to best ensure the validity of tests that will be performed on them. Sample handling where required shall duplicate conditions at the *Place of the Work* (such as site-cured concrete cylinders).

#### 1.4 MANUFACTURER'S FIELD REVIEW

- .1 Where manufacturer's field review is specified, manufacturer's representative shall review the relevant parts of work at the *Place of the Work*, or wherever such affected work is in progress, to ensure that work is being executed in accordance with manufacturer's written recommendations.
- .2 Manufacturer's field review is to ensure that the *Products* specified are being used in the *Work* and are being applied on surfaces prepared in accordance with their recommendations and the requirements of the *Contract Documents*.
- .3 Manufacturer's representative shall undertake such field review weekly, or additionally as necessary, to determine that the work of such sections is in accordance with manufacturer's written recommendations.
- .4 Manufacturer's representative shall submit a type written report on manufacturer's letterhead within 2 *Working Days* after each field review. Report shall document manufacturer's representative's field observations and recommendations.
- .5 Manufacturer's field review reports to be prepared and distributed following the procedures specified for preparation and submittal of inspection and testing reports given above.

#### 1.5 CONCRETE FLOOR SURFACE TOLERANCE TESTING

- .1 Concrete floor surface tolerance testing:
  - .1 Conduct and submit report of existing surface floor tolerances. Testing shall be performed by independent inspection and testing company and shall be paid for by the *Contractor*.
  - .2 Measure f-number finish tolerance requirements in accordance with CAN/CSA A23.1/A23.2 or by other method approved by the *Consultant* and submit log records of measurements.
  - .3 Testing is to be done to evaluate and determine the conditions and concrete floor surface tolerances prior to the installation of concrete underlayment and floor finish materials.
  - .4 Perform tests and proceed with flooring installations only after documented tests have been performed and reports submitted in writing and approved by the *Consultant*.

END OF SECTION

## **PART 1 – GENERAL**

### **1.1 GENERAL REQUIREMENTS**

- .1 Read and be governed by conditions of the *Contract* and sections of Division 1.
- .2 Providing all temporary construction means, methods and materials required to properly and safely perform the *Work*.
- .3 Owner will have the area of construction vacated prior to commencement of construction.

### **1.2 MAINTENANCE**

- .1 Use all means necessary to maintain temporary facilities and controls in proper and safe condition throughout progress of the *Work*.
- .2 In the event of loss or damage, immediately make all repairs and replacements necessary to *Consultant's* approval and at no additional cost to the *Owner*.

### **1.3 CONTRACTOR'S SITE OFFICE**

- .1 The site office shall be located at the *Place of the Work* to the approval of the *Owner*.
- .2 Make space available in office for use by *Consultant*. Include availability of *Contract Documents*, plan rack, layout table and other such items.
- .3 If space is available, other *Subcontractors* shall provide their own site offices, sheds and storage in a location designated by the *Contractor*. *Subcontractors* are to arrange and pay to have services extended and connected to services.
- .4 After removal of site office at end of construction restore the area to original condition or better to satisfaction of *Consultant*.

### **1.4 TELEPHONES AND FAX MACHINES**

- .1 Arrange and pay for the installation and use of an adequate telephone and fax service at the *Place of the Work*.
- .2 Telephone and fax service shall be for *Contractor's* and *Consultant's* use as required.
- .3 Mechanical and electrical *Subcontractors* shall arrange and pay for the installation and use of their own telephone and fax services at the *Place of the Work*.

### **1.5 ACCESS**

- .1 *Owner* will designate the access routes to and within the *Place of the Work*.
- .2 Ensure that *Owner's* personnel, the public, workmen and officials will have a safe, free and easy access to existing buildings from entrance route. Keep route free for all vehicular traffic.
- .3 Provide and maintain adequate access to the *Place of the Work*.
- .4 Where using existing roads for access to the *Place of the Work*, maintain such roads for duration of *Contract* and make good damage resulting from *Contractors'* use of existing roads.
- .5 Report all existing damaged areas in writing to the *Consultant*, prior to starting work of this *Contract*.

### **1.6 STORAGE**

- .1 Refer to Section 01 10 00 regarding material and equipment storage.

## 1.7 SANITARY FACILITIES

- .1 Use existing sanitary facilities designated by owner in existing building.

## 1.8 PARKING

- .1 Parking permits can be purchased at the Parking Services office.
- .2 Parking is on site. Costs are based on Owner's set fees and is on a first come first served basis.
- .3 Construction personnel may park in any visitors' parking lot with a valid parking permit pass.
- .4 Permits must be displayed on the windshield.
- .5 Permits are sold for a month's duration, whether or not it is used for the entire month. If workers shall require longer than one month, they shall renew their permit prior to the expiry date on the current permit. Workers will also receive a ticket if they are parked with an expired permit.

## 1.9 SITE ENCLOSURES AND BARRIERS

- .1 Erect temporary dust-proof hoarding (DPH) enclosures around entire area of the *Place of the Work* and include a dust-down vestibule at each access point. Coordinate locations with the Owner prior to beginning of work.
- .2 Hoarding construction to be a minimum of:
  - .1 Double layer gypsum board on metal studs, with 1" styrofoam board insulation, to extend from floor to finished ceiling or structure above to create a tightly sealed divider between the construction area and the public. Gypsum board to be taped and exposed on the inside (construction side). Gypsum board to be taped, mudded and painted on the outside (public side) to same standard of a typical permanent interior partition.
  - .2 Door in hoarding to be finished and painted in semi-gloss white on the outside (public side) to resemble a typical permanent interior door. Laminate 1" styrofoam board insulation on face of door on construction side. Provide weather stripping on all sides of door for added acoustical separation.
- .3 Contractor to review condition of hoarding and repair damages daily, and to maintain condition of hoarding.
- .4 Scheduling of the construction of hoarding to be coordinated with Owner.
- .5 Coordinate with Owner for Hospital's IPAC inspection. Obtain Owner's acceptance and approval to proceed in writing prior to commencing demolition.
- .6 Also refer to item 1.14.

## 1.10 CONSTRUCTION POWER SERVICES

- .1 Temporary electrical power supply is available from the Owner at the *Place of the Work* unless otherwise indicated. Provide all temporary facilities as required and connect to the power sources to the approval of Owner. Subcontractors requiring temporary electrical service shall acquire service through the Contractor.
- .2 The Owner will monitor the electricity consumption recorded on the meter and the Contractor will pay for any power consumed.
- .3 Any additional power required by the Contractor will need to be provided by portable generator. Any portable generators used to provide construction power must be classified as "super quiet type".

- .4 *Contractor* shall be responsible for obtaining necessary permits or regulatory approvals for temporary generators.

#### 1.11 WATER SUPPLY

- .1 The *Owner* will make water supply available to the *Contractor* for work under this *Contract*.
- .2 Permanent water supply system installed under this *Contract* may be used for construction requirements provided that guarantees are not affected thereby. Make good all damages.

#### 1.12 HEATING AND VENTILATING

- .1 Arrange and pay for costs of temporary heat and ventilation used during construction, including costs of installation, fuel, operation, maintenance and removal of equipment. Use of direct-fired heaters discharging waste products into work areas will not be permitted unless prior approval is given by *Consultant*.
- .2 Furnish and install temporary heat and ventilation in enclosed areas as required to:
  - .1 Facilitate progress of work of all *Subcontractors*.
  - .2 Protect work and products against dampness and cold.
  - .3 Prevent moisture condensation on surfaces.
  - .4 Provide ambient temperatures and humidity levels required for proper storage, installation and curing of materials.
  - .5 Provide adequate ventilation to meet health regulations for safe working environment.
- .3 Maintain minimum temperature of 10°C or higher where specified as soon as finishing work is commenced and maintain until acceptance of structure by *Consultant*.
- .4 Ventilating:
  - .1 Prevent hazardous accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
  - .2 Provide local exhaust ventilation to prevent harmful accumulation of *Hazardous Substances* into atmosphere of occupied areas.
  - .3 Dispose of exhaust materials in manner which will not result in harmful exposure to persons.
  - .4 Ventilate storage spaces containing hazardous or volatile materials.
  - .5 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful elements.
- .5 Maintain strict supervision of operation of temporary heating and ventilating equipment as follows:
  - .1 Enforce conformance with applicable codes and standards.
  - .2 Enforce safe practices.
  - .3 Prevent abuse of services.
  - .4 Prevent damage to finishes and floors, taking particular care when re-fueling.
  - .5 Vent direct-fired combustion units to outside.
  - .6 Ensure use of temporary heating units will not "dry out" concrete too quickly and thus form a weak layer of laitance on the top surface.

- .6 Supervise openings to existing building to ensure that areas adjacent to new building operations are maintained at minimum 22°C.

### 1.13 SCAFFOLDING

- .1 Provide and erect scaffolding independent of walls. Use scaffolding in such a manner as to interfere as little as possible with work of other *Subcontractors*. When not in use, move scaffolding as necessary to permit installation of other work. Construct and maintain scaffolding in a rigid, secure and safe manner. Remove it promptly when no longer required.
- .2 Treat wooden scaffolding with flame proofing agent. Use steel scaffolding, or suspended scaffolding where practical.

### 1.14 DUSTPROOF PARTITIONS

- .1 Provide temporary dustproof partitions where required to separate areas of new work from existing areas. Construct partitions for full height and width of openings, using 92 mm steel stud framing at 400 mm centres. Provide bracing as required.
- .2 Secure 4 mil polyethylene sheets to partition framing, on side of new work. Lap joints of polyethylene sheets minimum 100 mm.
- .3 Install 15.9 mm thick fire-rated gypsum wallboard on each side of steel studs. Install friction fit mineral fibre sound insulation in all hoarding partitions.
- .4 Tape perimeter of partition and butt joints of gypsum wallboard to provide positive seal.
- .5 Provide temporary passage door, complete with lockset and dust seal, where directed by *Consultant*.
- .6 Provide sticky floor mat on clean side of door, at each door location along dustproof partitions. Change daily or more frequently to maintain adhesivity of mat.
- .7 Provide HEPA filtered mobile air units to maintain negative air pressure in the construction areas inside and adjacent to existing occupied hospital areas.
- .8 Coordinate with Owner for Hospital's IPAC inspection. Obtain Owner's acceptance and approval to proceed in writing prior to commencing demolition.

### 1.15 FIRST AID

- .1 Provide, at the *Place of the Work*, such equipment and medical facilities as required by Workplace Safety and Insurance Act, to supply first-aid service to anyone who may be injured at the *Place of the Work*. In case of serious injury or death, report the accident immediately to the proper authorities and to the *Owner* and *Consultant*.

### 1.16 PROJECT SIGN

- .1 Provide one 24" x 48" project sign per floor. Content to be provided by *Owner* at a later date. Lay out sign and submit to *Consultant* for approval. Sign shall be painted by a professional sign painter, or printed by a professional sign printer, on corrugated plastic panel. Locate sign where directed by *Consultant*.
- .2 Only the project signs and notices regarding safety, caution, or instructions shall be erected on or near the *Place of the Work*.
- .3 Include 24-hour emergency contract number on the project sign.

#### **1.17 FUEL DRIVEN EQUIPMENT**

- .1 Gasoline, diesel, natural gas and propane driven equipment will not be permitted for work in the building structure without *Consultant's* written approval.

#### **1.18 REMOVAL OF TEMPORARY FACILITIES**

- .1 No direct payment will be made for any of the temporary services, offices and connections as specified, nor for any labour, materials, ground rental or other expense in connection therewith, and the costs thereof shall be considered as overhead items and distributed accordingly over all items of the *Contract*.
- .2 Remove temporary facilities from the *Place of the Work* when directed by *Consultant*.

#### **1.19 TEMPORARY EXIT MAINTENANCE**

- .1 Maintain temporary exit paths including temporary exit stairs free from obstruction and to satisfaction of *Owner* and jurisdictional authorities. Keep exterior exits free of ice and snow.

**END OF SECTION**

## **PART 1 – GENERAL**

### **1.1 GENERAL REQUIREMENTS**

- .1 Read and be governed by conditions of the *Contract* and sections of Division 1.

### **1.2 CLOSING OF EXITS**

- .1 All exits, including stairways and exterior doors to the outside, serving existing building must be maintained. Where exit is blocked off or deleted due to construction activities, acceptable alternative exit must be provided. In all cases, adequate means of egress shall be provided to permit the emergency evacuation of workers during an emergency.
- .2 Where it is absolutely necessary for access to be gained through construction area to exit, access must be clearly defined and protected so that it is separated from construction area by a reasonably smoke tight fire separation, equivalent to 3/4hour fire resistance rating.
- .3 Exiting plan must be completed by *Contractor* and approved by the City of Toronto for each phase of construction.

### **1.3 INTERSECTING CORRIDORS – EXISTING CORRIDORS ON OCCUPIED FLOORS AREAS EXPOSED TO NEW CORRIDORS UNDER CONSTRUCTION**

- .1 Temporary fire separations of steel studs and gypsum board construction, equivalent to 3/4hour fire resistance rating, must be erected.
- .2 Where access is desired, doorway must be protected by door of solid core wood or hollow steel construction.
- .3 Should temporary fire separations cut-off or eliminate required access to exits, alternative access must be provided.

### **1.4 CONTROL OF COMBUSTIBLE MATERIALS**

- .1 Stockpiling of construction materials adjacent to existing building must be carefully controlled.
- .2 Control of combustibles on construction site is regulated under Occupational Health and Safety Act.

### **1.5 EXPOSURE OF CONSTRUCTION IN PROGRESS TO EXISTING OCCUPIED AREAS**

- .1 Existing exterior windows of plain glazing when exposed to construction in progress must be protected by 15.9 mm thick cement bonded particle board on suitable framing for duration of construction.
- .2 Other openings in existing exterior walls such as doors, louvers, etc., must be similarly protected or replaced with doors of solid core wood or hollow steel construction.

### **1.6 OPENINGS CREATED THROUGH FLOORS OR OTHER FIRE SEPARATIONS**

- .1 Openings in existing floor assemblies and vertical fire separations necessitated by installation of equipment systems or construction in general must be temporarily sealed with fire barrier materials such as mineral wool or other non- combustible insulation.

### **1.7 MODIFICATION AND EXTENSION TO EXISTING FIRE ALARM SYSTEMS**

- .1 Maintaining the fire alarm system in operating condition throughout the *Work* will require careful planning, especially when extension to the fire alarm system is carried out in phases.

- .2 A technical representative from the fire alarm manufacturer shall be assigned by *Owner* to the project to coordinate different phases of the extension. *Contractor* to coordinate this work with the *Owner*.
- .3 Whenever a changeover time occurs, which is an outage time of at least a portion of the fire alarm system, the municipal fire department must be notified by *Contractor* of the temporary shutdown and alternative measures must be devised. *Contractor* to coordinate this work with the *Owner*.

## 1.8 SHUTDOWN OF FIRE PROTECTION SYSTEMS

- .1 Where temporary shut-down of sprinkler systems, standpipe systems or other fire protection systems is necessary due to alterations, repairs or extensions, the appropriate requirements in Ontario Fire Code, as well as *Owner's* requirements, must be observed.
- .2 *Contractor* is responsible for any costs incurred for the fire alarm false alarms caused by their work. The *Owner's* plant and facilities is fully protected with smoke detection equipment that will be activated by numerous construction procedures.
- .3 The *Owner* will, with written request a minimum 2 *Working Days* in advance, arrange to put any fire alarm zone in bypass to permit construction. Any *Contractor* working in the *Owner's* plant and facilities will be assessed \$1,500.00 fine per alarm payable to the *Owner* by certified cheque. Any *Contractor* causing false alarms and not paying such costs, will not be permitted to continue work until said cheque is received.
- .4 Requests shall identify the following information:
  - .1 Name of *Contractor*
  - .2 Where the *Contractor* will be working
  - .3 Telephone numbers of persons responsible
  - .4 Type of work being conducted
  - .5 Identify if fire/smoke/dust/vibration/flood will occur
  - .6 Indicate the start and stop times
- .5 Shutdown period will only be on weekends, from 9:00am to 5:00pm with notice to *Owner* at least 6 weeks before date of shut down. Coordinate through six-week detailed look-ahead.
- .6 To avoid unnecessary alarms during testing, disconnect only those zones being worked on. Zones shall be re-enabled by 1430 hours at the latest.
- .7 *Contractor* shall ensure that main control panel is manned at all times during shutdown period.

## 1.9 ADDITIONAL LIFE SAFETY MEASURES

- .1 Generally, additional life safety measures should include following additional requirements:
  - .1 *Contractors* should obtain alternate fire safety plan from the *Owner*.
  - .2 Submit and obtain written approval from local Fire Department for alternate Fire Safety Plan and Training Procedure. *Contractor* to coordinate work with the *Owner*.

END OF SECTION



## PART 1 – GENERAL

### 1.1 PRODUCTS

- .1 *Products* and product installation shall be in compliance with building codes, regulations and the requirements of authorities having jurisdiction.
- .2 Specified Options: The *Work* is based on materials, *Products* and systems specified by manufacturer's catalogued trade names, references to standards, by prescriptive specifications and by performance specifications.
  - .1 Where only one manufacturer's catalogued trade name is specified for a *Product*, the *Product* is single sourced and shall be supplied by the specified manufacturer. Refer to Section 01 25 00 for substitution procedures.
  - .2 Where more than one manufacturer's catalogue trade name is specified for a *Product*, supply the *Product* from any one of those manufacturers specified.
  - .3 When a *Product* is specified by reference to a standard, select any *Product* from any manufacturer that meets or exceeds the requirements of the standard.
  - .4 When a *Product* or system is specified by prescriptive or performance specifications, *Provide* any *Product* or system which meets or exceeds the requirements of the prescriptive or performance specifications.
  - .5 The onus is on the *Contractor* to prove compliance with governing published standards, prescriptive specifications and with performance specifications.
  - .6 Visual selection specification:
    - .1 Where specifications include the phrase "as selected by *Consultant* from manufacturer's full range" or similar phrase, select a product that complies with requirements. *Consultant* will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.
  - .7 Visual matching specification:
    - .1 Where specifications require "match *Consultant's* sample", provide a product that complies with requirements and matches *Consultant's* sample. *Consultant's* decision will be final on whether a proposed product matches.
- .3 *Products*, materials, equipment and articles (referred to as *Products* throughout the *Contract Documents*) incorporated in the *Work* shall be new, not damaged or defective, and of the quality standards specified. If requested, furnish evidence as to type, source and quality of *Products Provided*.
- .4 *Products* and materials shall be of odourless and zero-VOC type.
- .5 Where *Contract Documents* list acceptable *Products* or acceptable manufacturers, select as applicable, any one *Product* from any one manufacturer meeting performance of specifications and manufacturer's written application directions.
- .6 Where *Contract Documents* require design of a *Product* or system, and minimum material requirements are specified, the design of such *Product* or system shall employ materials specified within applicable section. Where secondary materials or components are not specified, augment with materials meeting applicable code limitations, and incorporating compatibility criteria with adjacent work.

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- .7 Defective *Products*, whenever identified prior to completion of the *Work*, will be rejected, regardless of previous reviews. Review of the *Work* by the *Consultant* or inspection and testing companies does not relieve the *Contractor* of the responsibility for executing the *Work* in accordance with the requirements of the *Contract Documents*, but is a precaution against oversight or error. Remove and replace defective *Products* and be responsible for delays and expenses caused by rejection at no increase in the *Contract Price*.
  - .8 Should any dispute arise as to quality or fitness of *Products*, the decision rests strictly with *Consultant* based upon the requirements of the *Contract Documents*.
  - .9 Unless otherwise indicated in the *Contract Documents*, maintain uniformity of manufacturer for any like item, material, equipment or assembly for the duration of the *Work*.
  - .10 *Products* exposed in the finished work shall be uniform in colour, texture, range, and quality, and be from one production run or batch, unless otherwise indicated, and as approved by *Consultant*.
  - .11 Permanent labels, trademarks and nameplates on *Products* are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical, electrical, machinery or like rooms.
  - .12 Owner retains right to select from choices available within specified *Products* for colours, patterns, finishes or other options normally made available. Submit full range of *Product* options in accordance with Section 01 33 00 for such selection.
  - .13 Quality Control:
    - .1 Implement a system of quality control to ensure compliance with *Contract Documents*.
    - .2 Notify *Consultant* of defects in the *Work* or departures from intent of *Contract Documents* that may occur during construction. *Consultant* will recommend appropriate corrective action in accordance with requirements of the *Contract*.
  - .14 *Product* Handling:
    - .1 Handle and store *Products* in a manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's and *Supplier's* recommendations and so as to ensure preservation of their quality and fitness for the *Work*, and protect from vandalism and theft.
    - .2 Store packaged or bundled *Products* in original and undamaged condition with manufacturer's seals and labels intact, facing to outside. Do not remove from packaging or bundling until required in the *Work*.
    - .3 Store materials susceptible to environmental damage in a weathertight enclosure raised clear of ground so that they are protected from weather, dampness and deterioration. Do not use such materials which have been damaged by exposure to moisture.
    - .4 Keep sand, when used as ingredients for grout, mortar or similar mixed materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
    - .5 Store sheet materials, lumber and other *Products* susceptible to deterioration on flat, solid supports and keep clear of ground or slab. Slope to shed moisture.
    - .6 Store and mix paints in a single designated, heated and ventilated room. Remove oily rags and other combustible debris from *Place of the Work* daily. Take every precaution necessary to prevent spontaneous combustion.
    - .7 Do not store any material on roofing which will cause damage to membrane. This applied to lumber, steel, wood cases, pipes, conduits, insulation, concrete block or any other materials.
    - .8 Carefully handle materials to preclude damaging existing surfaces and work of others.

- .9 Remove and replace damaged *Products*.
- .10 Transportation:
  - .1 Pay cost of transportation of *Products* required in performance of *Work*.
  - .2 Transportation cost of *Products* supplied by *Owner* will be paid for by *Owner*. Unload, handle and store such *Products* at the *Place of the Work*.
  - .3 Reject *Products* damaged during transport.
  - .4 Transportation of *Products* must be undertaken to suit Construction Schedule. *Contractor* is responsible for determining mode of transport to ensure delivery, obtaining shop drawings, placement of orders, and on-time premium costs, air freight, and the like.

## 1.2 AVAILABILITY OF PRODUCTS

- .1 In the event of delays in supply of *Products*, and should it subsequently appear that the *Work* may be delayed for such reason, *Consultant* reserves the right to substitute more readily available *Products* of similar character, at no additional cost to the *Owner*.

## 1.3 MANUFACTURER'S INSTRUCTIONS

- .1 Unless otherwise indicated in the *Contract Documents*, install or erect *Products* in accordance with manufacturer's current printed instructions. Do not rely on labels or enclosures supplied with *Products*. Obtain printed instructions directly from manufacturers.
  - .1 If instructions are not available, obtain directions from the manufacturer in writing before proceeding. The proceeding of work without this direction is at the *Contractor's* sole risk. It is the *Contractor's* responsibility to conform to building code requirements in the event that manufacturer's instructions and directions conflict with the building code. Improper installation or erection of *Products*, due to failure in complying with manufacturer's requirements will require removal and re-installation at no cost to *Owner*.
  - .2 Notify *Consultant* in writing, of conflicts between the *Contract Documents* and manufacturer's instructions, or between manufacturer's instruction and the building code.
  - .3 Improper installation or erection of *Products*, due to failure in complying with these requirements, authorizes *Consultant* to require removal and re-installation at no additional cost to the *Owner*.
  - .4 Manufacturers' representatives shall have access to the *Work* at all times. *Contractor* shall render assistance and facilities for such access in order that the manufacturers' representatives may properly perform their function.

## 1.4 WORKMANSHIP

- .1 General:
  - .1 Execute the *Work* using workers experienced and skilled in the respective duties for which they are employed.
  - .2 Do not employ an unfit person or anyone unskilled in their required duties.
  - .3 Decisions as to the quality or fitness of workmanship in cases of dispute rest solely with *Consultant*, whose decision is final.
  - .4 Submit proof of qualifications of *Subcontractors* upon request by the *Consultant* to verify *Subcontractor's* qualifications and experience meet the requirements of the *Contract Documents*. Submit such proof in the form of a *Subcontractor's* qualification statement in accordance with Section 01 33 00.

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- .5 Gypsum board and metal support framing *Subcontractor* shall be unionized. Submit written proof upon request by the *Consultant*.
  - .2 Coordination:
    - .1 Ensure cooperation of workers in layout of the *Work*. Maintain efficient and continuous supervision.
    - .2 Be responsible for coordination and placement of openings, sleeves and accessories.
  - .3 Concealment:
    - .1 In finished areas, conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.
    - .2 Before installation, inform *Consultant* of any contradictory situation. Install as directed by *Consultant*.
  - .4 Cutting and Remedial Work:
    - .1 Perform cutting and remedial work required to make parts of the *Work* come together. Coordinate the *Work* to ensure this requirement is maintained. Obtain permission from *Consultant* before commencing any cutting. Refer also to requirements of Section 01 73 29.
  - .5 Location of Fixtures:
    - .1 Consider location of fixtures, access panels, outlets and mechanical and electrical items indicated as approximate only. Locate fixtures, and the like approximately; Architectural drawings will relate these items to known dimensions, such as ceiling tile grid or wall locations and the like.
    - .2 Obtain *Consultant's* acceptance for precise locations of fixtures, access panels, outlets, mechanical, and electrical items.
    - .3 *Consultant* reserves the right to relocate electrical outlets and mechanical fixtures at a later date, but prior to installation, without cost, provided that the relocation per outlet does not exceed 3050 mm (10') from the original location.
    - .4 Inform *Consultant* of conflicting installations. Install only as directed by *Consultant*.
  - .6 Fasteners, anchoring devices, and accessories:
    - .1 In addition to requirements for fastening devices specified in the technical sections of the specifications, include for all fastenings, inserts, caps, closures, anchors, and accessories required for execution of work, and be entirely responsible for their installation.
    - .2 Unless specified otherwise in the *Contract Documents*, use metal fastenings of same material as the metal component they are anchoring, of metal which will not set up electrolytic action which could cause damage to fastenings or components under moist conditions. In general, use non-corrosive or hot-dipped galvanized steel as exterior anchors for windows, roofing, sheet metal, and anchors occurring on or in an exterior wall or slab, or interior wet areas such as showers, janitors garbage rooms or similar spaces where moisture will be present.
    - .3 If exposed fastenings and accessories are allowed by the *Contract Documents* in finished areas, use fastenings and accessories of same texture, colour and finish as base metal on which they occur. Keep such exposed fastenings and accessories to a minimum, spaced and laid out evenly and neatly and cut off to make them as inconspicuous as possible, but still provide necessary securement.

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- .4 Install work with fastenings or adhesives in sufficient quantity to ensure permanent secure anchorage of materials, constructions, components and equipment under static conditions, and to resist building thermal movement, creep and vibration. Space anchors within limits of load-bearing or shear capacity.
  - .5 Select all anchoring devices to have a safety factor of 4 against failure for their design load. Do not install fibre, plastic or wood plugs or blocking for fastenings in masonry, concrete, or metal construction, unless specified or indicated otherwise.
  - .6 Install fastenings of permanent type. Do not install wood plugs.
  - .7 Fastenings which cause spalling or cracking of material to which anchorage is made are not permitted.
  - .8 The use of explosive powder tools will not be permitted under any circumstances unless equipped with a device which positively prevents free flight of the stud.
  - .9 Expansion Bolt and All-In-One Anchors
    - .1 Whenever expansion type fastening devices of any kind which rely upon friction forces created by expansion of the device or all-in-one screw anchors in drilled holes of the Tapcon type are to be used in concrete and masonry, submit following data to *Consultant* for review prior to use:
      - .1 Load carrying capacity of device and design factor of safety.
      - .2 Effect of building movement and vibration on device.
      - .3 Identification marking applied on device.
      - .4 Nature and magnitude of force to be applied to device with supporting data.
      - .5 Materials to which device is fastened.
      - .6 Whether device is self drilling or, if not, the size of bit to be used to drill holes to receive the device.
      - .7 Installation procedure to ensure that fastener is secure and reliable and that metal reinforcing is not damaged.
    - .2 The *Consultant* may request that all such data bear the seal of a professional structural engineer licensed to practice at the *Place of the Work*, and in accordance with Section 01 33 00.
    - .3 If requested by the *Consultant*, conduct tests of installed fasteners at the *Place of the Work* using an approved independent testing company with properly designed and calibrated force measuring apparatus.
  - .7 Thermal expansion and contraction:
    - .1 Conform to manufacturer's recommended installation temperatures. If finishes such as tile, resilient flooring, etc., are installed at temperatures different from operation of service temperatures, make provisions for expansion and Contraction in service as approved by *Consultant*. Repair all resulting damage should expansion provisions prove inadequate.
  - .8 Dielectric separation:
    - .1 Ensure that a dielectric separator is provided in a permanent manner over entire contact surfaces to prevent electrolytic action (galvanic corrosion) between dissimilar metals. Similarly, prevent corrosion to aluminum in contact with alkaline materials such as contained in concrete, masonry and like construction.
  - .9 Protection of work in progress:

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- .1 Take reasonable and necessary measures, including those required by authorities having jurisdiction, to *Provide* protection.
  - .2 Adequately protect parts of the *Work* completed or in progress. Parts of the *Work* damaged or defaced due to failure in providing such protection is to be removed and replaced, or repaired, as directed by the *Consultant*, at no increase in the *Contract Price*.
  - .3 Prevent overloading of any part of the building. Do not cut, drill or sleeve any load bearing structural member without written permission of *Consultant*, unless specifically indicated. Refer also to Section 01 73 29.
  - .4 Adequately protect finished flooring from damage. Take special measures when moving heavy loads or equipment on them.
  - .5 Keep floors free of oils, grease or other materials likely to discolour them or affect bond of applied surfaces.
  - .6 Protect work of other *Subcontractors* from damage while doing subsequent work. Damaged work shall be made good by appropriate *Subcontractors* but at expense of those causing damage.
  - .7 Protect existing buildings, curbs, roads and lanes. If, during the *Work*, any buildings, curbs, roads or lanes are damaged, bear costs for repairs.
- .10 Existing Utilities:
- .1 When breaking into or connecting to existing services or utilities, execute the *Work* at times approved by *Owner*, with a minimum of disturbance to *Owner's* ongoing operations, the *Work*, and traffic.
  - .2 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in a manner approved by authority having jurisdiction and stake or otherwise record location of capped service.
- .11 Protection of Mechanical and Electrical *Products* or *Materials*:
- .1 Wrap in protective plastic and seal mechanical and electrical items of mechanical and electrical equipment prior to and during for shipment, storage at the *Place of the Work* and after installation.
  - .2 Remove protective coverings only to the extent required for installation of the items. Re-install protection immediately following installation.
  - .3 Remove protective coverings in stages, as work areas are completed, or when directed by *Consultant*.

END OF SECTION

## PART 1- GENERAL

### 1.1 GENERAL REQUIREMENTS

- .1 Read and be governed by conditions of the *Contract* and sections of Division 1.
- .2 Typically the *Contractor* shall restore any and all existing surfaces disturbed by new construction operations whether or not such restoration is noted on drawings. "Restore" is defined herein as the provision of all work necessary for bringing a disturbed area, material, surface, assembly or system to its original finished condition or better.
- .3 *Provide* built in chases and recess, and cutting and patching, core-drilling, sleeving and making good as required to accommodate the completion of the *Work*. Be responsible for, and coordinate the responsibility of cutting and patching work between the trades, in particular cutting, patching, and core-drilling work specified in Divisions 21, 22, and 23 and Divisions 26, 27, and 28.

### 1.2 RELATED SECTIONS

- .1 01 10 00 General Instructions: Coordination of service interruptions, shutdowns.

### 1.3 DESCRIPTION

- .1 Execute cutting and remedial work required to:
  - .1 Make several parts fit properly.
  - .2 Uncover work to provide for installation of ill-timed work.
  - .3 Remove and replace defective work.
  - .4 Remove and replace work not conforming to requirements of *Contract Documents*.
  - .5 Remove samples of installed work as specified for testing and mockups.
  - .6 Install specified work in existing construction.
- .2 In addition to *Contract* requirements, upon written instructions of *Consultant*:
  - .1 Uncover work to provide for *Consultant's* observation of covered work.
  - .2 Remove samples of installed materials for testing.
  - .3 Remove work to provide for alteration of existing work.
  - .4 Uncover work as needed for abatement of hazardous substances in concealed areas.
- .3 Do not endanger any work by cutting or altering work or any part of it.
- .4 Do not cut or alter work of another *Subcontractor* without written consent of the *Subcontractor* in question and the *Consultant*.

### 1.4 SUBMITTALS

- .1 Prior to cutting, boring, or sleeving load-bearing members, or items which affect structural safety of the *Work*, or work of another *Subcontractor*, submit written notice to *Consultant* requesting consent to proceed with cutting, including information as to size, location, timing, trade and tools to be used. Obtain approval of location and methods. Submit proposals for cutting, drilling or sleeving approval giving all details including location of reinforcement in concrete structure confirmed by non-destructive positive method other than by x-rays.

- .2 Should conditions of work or schedule indicate change of materials or methods, submit written recommendation to *Consultant* including conditions indicating change, recommendations for alternative methods or materials, and submittals as required for substitutions.
- .3 Submit written notice to *Consultant* designating time work will be uncovered, to provide for observation.

## 1.5 COORDINATION

- .1 All electrical and mechanical equipment and wiring which must be built into or interfaced with the building components, or pass through structure, walls, floors, etc., shall have their installation pre-planned cooperatively with the respective *Subcontractors* involved. The resultant need for cutting and patching shall, therefore, be reduced to an absolute minimum.
- .2 Chasing, cutting, patching, drilling and sleeving of work shall be performed only by the *Contractor* as specified in this section. The *Subcontractor* requiring cutting, drilling or sleeving for installation of its work shall inform the *Contractor* of the final location and other requirements for the cutting, drilling and sleeving. *Contractor* to coordinate with Mechanical and Electrical *Subcontractors*. Refer to Divisions 21, 22, and 23 and Divisions 26, 27, and 28 for requirements for their respective work.
- .3 Note: Core floor, roof and structural wall openings indicated on drawings shall be performed by a professional concrete saw cutting and coring *Subcontractor*.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- .1 For restoration, use materials same as those utilized for the original installation.
- .2 For replacement of work removed, comply with the *Contract Documents* for the type of work to be done.

## PART 3 - EXECUTION

### 3.1 INSPECTION

- .1 Inspect existing conditions of work, including elements subject to movement or damage, during cutting and patching and excavating and backfilling.
- .2 After uncovering work, inspect conditions affecting installation of new work.

### 3.2 PREPARATION PRIOR TO CUTTING

- .1 *Provide* shoring, underpinning, bracing and support as required to maintain structural integrity of new and existing the *Work*.
- .2 *Provide* protection for other portions of the *Work*.
- .3 *Provide* protection from the elements.

### 3.3 PERFORMANCE

- .1 Execute fitting and adjustment of the *Work* to provide finished installation to comply with specified tolerances and finishes.
- .2 Execute cutting and demolition by methods which will prevent damage to other work, and will provide proper surfaces to receive installation of repairs and new work.



- .3 Employ appropriate *Subcontractor* with skilled labour to perform cutting and patching of exposed surfaces.
- .4 Cut materials using proper equipment and methods. Pneumatic or impact tools are not allowed without prior approval of the *Consultant*.
- .5 Properly fit work to pipes, sleeves, ducts, conduit and other penetrations through surfaces.
- .6 At penetration of fire-rated ceilings, walls or floor constructions, completely seal voids with fire rated materials, to the full thickness of the construction element as indicated on *Drawings*.
- .7 Make cuts with clean, true, smooth edges. Fit unit to tolerances established by best standard practice for applicable work. Make patches invisible in final assembly.
- .8 Complete and tightly fit all construction to pipes, ducts, and conduits which pass through construction, to completely prevent the passage of air.
- .9 Restore work which has been cut or removed. Install new products to provide completed work in accordance with the requirements of the *Contract Documents*.
- .10 Refinish entire surfaces as necessary to provide an even finish.
  - .1 Continuous surfaces: to nearest intersections.
  - .2 Assembly: entire refinishing.

END OF SECTION

## **PART 1 – GENERAL**

### **1.1 GENERAL REQUIREMENTS**

- .1 Read and be governed by conditions of the *Contract* and sections of Division 1.
- .2 Refer also to Article GC3.14 of the General Conditions of the *Contract*, as amended by Document 00 73 00, and Section 01 35 33 Infection Control During Construction.
- .3 Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
- .4 Store volatile wastes in covered metal containers containing water if necessary, and remove from premises daily.
- .5 Prevent accumulation of wastes which create hazardous conditions.
- .6 Provide adequate ventilation during use of volatile or noxious substances.
- .7 Upon completion of work of each trade, each *Subcontractor* shall thoroughly clean its work and leave its work in a suitable condition acceptable to *Consultant* and to other *Subcontractors* requiring the suitable condition.
- .8 Final cleaning shall be in accordance with Sections 01 35 33 and 01 77 00.
- .9 Cleaning is applicable to the whole *Project* and for work carried as cash allowance amounts as listed in Section 01 21 00.

### **1.2 MATERIALS**

- .1 Use only cleaning materials recommended by manufacturer of surface to be cleaned and as recommended by cleaning material manufacturer. All cleaning products to be approved by the *Owner* prior to use.

### **1.3 CLEANING DURING CONSTRUCTION**

- .1 Clean the Area of Work and along the Contractor's path of travel as frequent as required to maintain cleanliness of space, minimum once per day. Contractor's path of travel may be required to be clean each time after use. Ensure mud, debris, dirt and foot prints are removed by vacuuming or mopping. Sweeping is not permitted.
- .2 Obtain permit and provide dump containers at the *Place of the Work* for collection of waste materials and rubbish.
- .3 Regularly remove waste materials and rubbish from the *Place of the Work*.
- .4 Vacuum clean building interior areas when ready to receive finish painting and coatings and continue vacuum cleaning on an as-needed basis until the area is ready for occupancy or *Substantial Performance of the Work*.
- .5 Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted and coated surfaces.

### **1.4 FINAL CLEANING**

- .1 Refer to Section 01 77 00.

**END OF SECTION**

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## PART 1 – GENERAL

### 1.1 GENERAL

- .1 The procedures for completing *Contract* and acceptance by the *Owner* shall be in accordance with the methods described in OAA/OGCA Document 100 (December 12, 2007) and any additional requirements described below.
- .2 Within 4 weeks of commencement of the *Work*, submit to the *Consultant* a list of closeout *Submittals* required by the *Contract Documents*.

### 1.2 FINAL CLEANING

- .1 Environmental controls:
  - .1 Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
  - .2 Store volatile wastes in covered metal containers, and remove from *Place of the Work* daily.
  - .3 Prevent accumulation of wastes which create hazardous conditions.
  - .4 Provide adequate ventilation during use of volatile or noxious substances.
- .2 Materials:
  - .1 Use only cleaning materials recommended by manufacturer of surface to be cleaned and as recommended by cleaning material manufacturer.
- .3 Final cleaning:
  - .1 Immediately prior to *Consultant's* review to determine if *Substantial Performance of the Work* has been achieved, remove surplus *Products* and construction machinery and equipment not required for the performance of the remaining *Work*.
  - .2 Remove waste *Products* and debris other than that caused by the *Owner*, and leave the *Work* clean and suitable for occupancy by *Owner*.
  - .3 When the *Contract* is completed, remove surplus *Products*, tools, construction machinery and equipment.
  - .4 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, mechanical and electrical fixtures. Replace broken, scratched or disfigured glass. Leave in condition equivalent to existing.
  - .5 Remove stains, spots, marks and dirt from decorative parts of the *Work*, electrical and mechanical fixtures, furniture fittings, walls, and floors.
  - .6 Vacuum clean and dust building interiors, behind grilles, louvres, and screens. Thoroughly vacuum clean interior of electrical equipment.
  - .7 Polish, seal, shampoo or prepare floor finishes to recommendations of manufacturer. Clean and seal concrete floor surfaces with non-skid, matte sealer.
  - .8 Inspect finishes, fittings and equipment and ensure specified workmanship and operation.
  - .9 Broom clean and wash exterior walks, steps and surfaces.
  - .10 Remove dirt and other disfigurements from exterior surfaces.
  - .11 Sweep and wash clean paved areas at the *Place of the Work*.

- .12 Clean equipment and fixtures to a sanitary condition, clean or replace filters of mechanical equipment.
- .13 Remove seal wrap on mechanical and electrical *Products* and materials and clean as required.
- .14 Clean and/or replace lamps, light fixtures, lenses and grilles.
- .15 Remove protective covering from lamps, hardware, and speciality items.
- .16 Under the direction of the *Consultant*, aim adjustable luminaires.

### 1.3 CLOSEOUT SUBMITTALS

- .1 Collect reviewed *Submittals*, and assemble required closeout *Submittals* executed by *Subcontractors*, *Suppliers*, and manufacturers. Prior to submitting closeout *Submittals* to the *Consultant* for *Substantial Performance of the Work*, undertake the following:
  - .1 Review maintenance manual contents (operating, maintenance instructions, as-built *Drawings*, materials) for completeness.
  - .2 Review supply and completeness of spare parts required by *Contract Documents* and manufacturers.
  - .3 Review cash allowances in relation to *Contract Price*, change orders, holdbacks and other adjustments to the *Contract Price*.
  - .4 Review inspection and testing reports to verify conformance to intent of *Contract Documents* and that changes, repairs or replacements have been completed.
  - .5 Execute transition of performance bond and labour and materials payment bond to warranty period requirements.
  - .6 Submit a final statement of accounting giving total adjusted *Contract Price*, previous payments, and monies remaining at time of application for completion of the *Contract*. *Consultant* will issue a final change order reflecting approved adjustments to *Contract Price* not previously made.
  - .7 Contractor to submit a letter issued by the City of Toronto that states all building permit components have been closed by the building inspector.
- .2 No later than 10 *Working Days* prior to submitting request for *Consultant's* review to determine if *Substantial Performance of the Work* has been achieved, submit to the *Consultant* the closeout *Submittals* specified in this section, including, but not limited to, reviewed *Shop Drawings*, *Product* data sheets, samples, operating instructions, as-built records, fully executed warranties and guarantees, reports recording demonstration and instruction provided to *Owner* for operation and maintenance of building systems, software required for operation and maintenance of building systems, maintenance materials, and keys.
- .3 For equipment put into use with *Owner's* permission during the *Work*, submit required closeout submittals within 10 *Working Days* after start-up.
- .4 For items of the *Work* delayed materially beyond date of *Substantial Performance of the Work*, provide updated closeout submittals within 10 *Working Days* after acceptance, listing date of acceptance as start of warranty period.
- .5 Neither the *Consultant's* review to determine if *Substantial Performance of the Work* has been achieved, nor acceptance of the *Work*, will take place until receipt, by the *Consultant*, of acceptable copies of the closeout submittals required herein and by the *Contract Documents*.
- .6 As-built records:

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- .1 Owner will provide 1 reproducible set of *Contract Documents* to the *Contractor* for as-built drawing purposes.
  - .2 Accurately record changes to the *Work* and deviations from *Contract Documents* as the *Work* progresses.
  - .3 Mark changes in red ink.
  - .4 Record, without being limited to, the following:
    - .1 Depths of various elements of foundation in relation to survey datum.
    - .2 Horizontal and vertical location of utilities and appurtenances referenced to permanent surface improvement.
    - .3 All other underground installations and services set beneath slabs-on-grade referenced to visible and accessible features of structure.
    - .4 'AS-BUILT' elevations of paving, sidewalks, manholes and catchbasins.
    - .5 Field changes of dimensions/details.
    - .6 Changes by change order/change directive/supplemental instructions.
    - .7 Locations of interior mechanical and electrical equipment and distribution.
    - .8 Elevations and location depths of services. Identify type and size of service and materials used.
    - .9 As-built *Specifications* manuals: Record as-built *Products*, including manufacturer, manufacturer's model or system number and finish / finish system.
    - .10 At completion of the *Project* turn over the set of *Contract Documents* to the *Consultant*.
  - .7 Digital as-built records:
    - .1 Once hard copy of as-built record Drawings have been accepted by *Consultant*, *Contractor* shall receive digital "Revit" model from the *Consultant*, to update drawings to reflect "As-Built" conditions as referenced above. Refer also to requirements of *Divisions 21, 22, and 23 / Divisions 26, 27, and 28*.
    - .2 *Contractor* shall transcribe hard copy changes to the *Drawings* into the electronic media.
    - .3 After final acceptance by *Consultant*, submit 2 disc copies of revised electronic media as-built *Drawings* to *Owner* in Revit and PDF format, and submit 2 full size hard copies of the as-built *Drawings*.
  - .8 *Specifications* manuals
    - .1 Submit 2 copies of as-built *Specifications* manuals.
  - .9 Posted operating instructions
    - .1 Prepare operating instructions in English for posting near equipment and systems. Posted instructions to be glass covered, framed and mounted.
    - .2 Posted instructions to consist of simplified, consolidated equipment, control and power diagrams graphically representing the entire system, including concise instructions on how to start and stop systems, what settings and conditions are to be observed by the operators, and what control adjustments are to be made or maintained by the operator.
    - .3 Posted instructions shall include control diagrams with added specific operating instructions, controls, interlocks, etc.

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- .4 Posted instructions shall include:
    - .1 HVAC controls for each system;
    - .2 One line schematic diagrams of water supply;
    - .3 One line isometric diagrams of sanitary drainage;
    - .4 One line diagrams of steam distribution, hot and cold water systems, including risers, valves, control devices, etc.
  - .10 Operation and maintenance manuals
    - .1 Submit 2 hard copies and 1 digital PDF format copy on CD-RW or DVD-RW of maintenance manuals, consisting of the following general components:
      - .1 Shop drawing manuals,
      - .2 Warranty manuals, and
      - .3 *Project* data book
    - .2 Operation and maintenance manuals shall contain operating and maintenance data and information specified below for supplied *Products*, in English, and shall be made up as follows:
      - .1 Bind each general component of the operation and maintenance manuals in separate vinyl hard covered, 3 ring loose leaf binders for 213 mm x 275 mm (8-1/2" x 11") size paper.
      - .2 Enclose title sheet, labelled as applicable, with project name, date and list of contents.
      - .3 Organize contents into applicable sections of work to parallel project specifications break-down. Mark each section by labelled tabs protected with celluloid covers fastened to hard paper dividing sheets.
      - .4 Neatly type lists and notes. Use clear drawings, diagrams of manufacturers' literature.
    - .3 Shop Drawing manuals:
      - .1 Submit one copy of each final accepted *Shop Drawing* issued for the *Work* on which have been recorded changes made during fabrication and installation caused by unforeseen conditions.
    - .4 Warranty manuals:
      - .1 Submit copies of bonds, guarantees, warranties and extended warranties together in one report binder, complete with an indexed summary list of warranties and expiration dates. Warranties to be in accordance with Section 01 78 36.
    - .5 *Project* data book: shall include the following information supplemented by additional required data specified elsewhere in the *Contract Documents*:
      - .1 Maintenance instruction for finished surfaces and materials.
      - .2 Copy of hardware and paint schedules.
      - .3 Description, operation and maintenance instructions for equipment and parts list. Indicate nameplate information such as make, size, capacity, serial number.
      - .4 Names, addresses and phone numbers of *Subcontractors* and *Suppliers*, as applicable.
      - .5 Additional material used in the *Work* listed under various sections showing name of manufacturer and source of supply.

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- .6 Charts, diagrams and reports identified in Divisions 21, 22, and 23 and Divisions 26, 27, and 28 of the *Specifications*.
  - .7 Report recording demonstration and instruction provided to *Owner* for operation and maintenance of building systems as described below in this section.
  - .8 Key construction photos.
  - .9 Permits and forms:
    - .1 Occupancy permit; statutory declarations.
    - .2 Workplace Safety & Insurance Board certificate of clearance.
    - .3 Certificates of approval of the *Work* by local building department (if available).
    - .4 Electrical authority certificate of inspection.
  - .11 Maintenance materials:
    - .1 Provide overage, extra stock, and maintenance materials. For required materials, see individual sections of *Specifications*. Deliver to a location and at a time specified by the *Owner*, and as follows:
      - .1 Use unbroken cartons, or if not supplied in cartons, material shall be strongly packaged.
      - .2 Clearly mark cartons or packaging as to contents, project name, and *Supplier*.
      - .3 If applicable give colour and finish, room number or area where material is used.
    - .2 Replace incorrect or damaged maintenance materials delivered to *Owner*, including damage through shipment.
    - .3 Provide a typed inventory list of maintenance materials prior to *Substantial Performance of the Work* application. List all items, complete with quantities, and storage locations.
    - .4 Establish a master list identifying maintenance materials and maintain a log of when materials are turned over to *Owner* and signing authority for acceptance of materials on behalf of *Owner*.

#### 1.4 SYSTEM DEMONSTRATION AND PROJECT COMMISSIONING

- .1 Refer to requirements of Section 01 81 13, and Divisions 21, 22, and 23 and Divisions 26, 27, and 28 with respect to *Commissioning*.
- .2 Perform system demonstration and *Commissioning* work no later than 10 *Working Days* prior to submitting request for *Consultant's* review to determine if *Substantial Performance of the Work* has been achieved.
- .3 Submit required certificates of approval or acceptance from authorities having jurisdiction.
- .4 Review condition of equipment such as lighting, elevators and heating system, which has been used in the course of the *Work* to ensure turning over at completion in "as new condition" with warranties dated and certified from time specified.
- .5 When partial occupancy of uncompleted project is required by *Owner*, coordinate *Owner's* uses, requirements, access, and the like, with *Contractor's* requirements to complete the *Work*.
- .6 Demonstration and instruction:
  - .1 Demonstrate operation of each system to *Owner* and *Consultant*.

- .2 Instruct *Owner's* personnel in operation, adjustment and maintenance of equipment and systems, using operation and maintenance data provided as the basis for instructions. Arrange and coordinate instruction of *Owner's* staff in care, maintenance and operation of building systems and finishes by *Suppliers* and *Subcontractors*.
- .3 *Contractor*, manufacturer's representatives, and responsible personnel from *Subcontractors* whose work is being demonstrated shall be present at these demonstrations.
- .4 Instruct *Owner's* representative on use of software required for operation and maintenance of building systems and provide a toll-free telephone number or website address for further assistance to the *Owner*.
- .5 Prepare and insert additional data in the operation and maintenance data manuals when the need for additional data becomes apparent during demonstration or instruction.
- .6 Demonstration and instruction report: Submit a written report of such demonstration, instruction, and *Commissioning* to the *Consultant* as part of the contract closeout submittals described earlier in this section. Report shall include time and date of each demonstration, instruction, and *Commissioning* activity, complete with a list of persons present.
- .7 Correct deficiencies and defects identified during demonstration, instruction, or *Commissioning*.
- .8 Attend 'end-of-work' testing and break-in or start-up demonstration.

## 1.5 SUBSTANTIAL PERFORMANCE OF THE WORK

- .1 Deficiency review:
  - .1 Neither *Owner* nor *Consultant* will be responsible for preparation or issuance of extensive lists of deficiencies. *Contractor* assumes prime responsibility for ensuring that items shown and described in the *Contract Documents* are complete. Any reviews to approve the certificate of *Substantial Performance of the Work* will be immediately cancelled if it becomes obvious to the *Consultant* that extensive deficiencies are outstanding.
  - .2 The *Contractor* shall conduct an inspection of the *Work* to identify deficiencies and defects, which shall be repaired. When the *Contractor* considers that the *Work* is substantially performed, the *Contractor* shall prepare and submit to the *Consultant* a comprehensive list of items to be completed or corrected and apply for a review of the *Work* by the *Consultant* to determine if *Substantial Performance of the Work* has been achieved.
  - .3 The *Contractor's* request described above shall include a statement by *Contractor* that the *Work* to be reviewed by *Consultant* and *Owner* for deficiencies is at the time of the deficiency review meeting, to the best of the *Contractor's* knowledge, in compliance with *Contract Documents*, reviewed shop drawings, and samples, and that deficiencies and defects previously noted by *Consultant* have been repaired. Documentation of inspections shall mean the typing and issuing of deficiencies noted during inspections and deficiency review meeting by the *Consultants* and *Owner* (tape recorded) and updates as remedial work progresses and subsequent inspections and meetings take place. (The *Contractor* shall prepare separate punch lists for the subtrades.)
  - .4 No later than 10 *Working Days* after the receipt of the *Contractor's* request described above, but contingent upon the prior receipt, by the *Consultant*, of the closeout submittals in the manner and form specified in this section, the *Consultant*, *Owner* and the *Contractor* will review the *Work* to identify any defects or deficiencies. If necessary, the *Contractor* shall tabulate a list of deficiencies to be corrected prior to *Substantial Performance of the Work* being certified by the *Consultant*. During review, the *Consultant*, *Owner* and the *Contractor* will decide which deficiencies or defects must be rectified before *Substantial Performance of the Work* can be certified, and which defects are to be treated as warranty items.



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- .5 Provide a schedule of planned deficiency review having regard to the foregoing.
  - .2 Certification of *Substantial Performance of the Work*:
    - .1 When the *Consultant* considers that the deficiencies and defects have been completed and that it appears that the requirements of the *Contract Documents* have been substantially performed, the *Consultant* shall issue a certificate of *Substantial Performance of the Work* to the *Contractor*, stating the date of *Substantial Performance of the Work*.
    - .2 The certificate of *Substantial Performance of the Work* shall be prepared in form required by Construction Lien Act.
  - .3 Final Inspection for completion of the *Contract*:
    - .1 Deficiencies and defects shall be made good before the *Contractor* submits a written request for final review of the *Work* and before the *Contract* is considered complete.
    - .2 When *Contractor* is satisfied that the *Work* is complete, and after the *Contractor* has reviewed the *Substantial Performance of the Work* to verify its completion in accordance with the requirements of the *Contract Documents*, the *Contractor* shall submit a written request for a final review during the follow up mandatory deficiency review by the *Consultant*, who in turn will notify the *Owner*.
    - .3 If there are any deficiencies identified as a result of this mandatory review, they shall be listed by the *Consultant* and *Owner* and submitted to the *Contractor*. This list shall be recognized as the final deficiency list for purposes of acceptance of the *Work* under the *Contract*.
    - .4 Such deficiencies shall be corrected by a date mutually agreed upon between *Consultant*, *Owner* and the *Contractor*, unless a specific date is required by *Contract*, and a further final deficiency review by the *Consultant* and *Owner* shall be called for by the *Contractor* following his own review to take place within 7 days from date of request.
    - .5 *Contractor* shall thereafter submit invoice for final payment.
    - .6 Money shall be withheld for deficiency work and will be released only when all deficiencies have been completed, including Final Photographs. No partial payment to be recognized until all work is completed.

## 1.6 WARRANTY PERIOD

- .1 Provide on-going review and attendance to building call-back, maintenance and repair problems during the warranty periods.
- .2 At the beginning of the 12<sup>th</sup> month after *Substantial Performance of the Work*, the *Owner*, *Contractor* and *Consultant*, along with key *Subcontractors* as designated, shall carry out a complete review of building and its systems to determine which deficiencies are to be rectified under the warranty. *Contractor* shall be responsible for timely written notification of *Owner*, and *Consultant* prior to such end of warranty period inspection and any delay in such notification shall extend such warranty period until proper notification is received by *Owner*, and *Consultant*.

END OF SECTION

## 1.1 WARRANTIES

- .1 Warranties shall be in accordance with General Condition GC 12.3, as amended by Section 00 73 00, and as follows:
  - .1 Warranties shall commence at date of *Substantial Performance of the Work*.
  - .2 Submit warranties for applicable items, signed by the applicable company responsible for each warranty.
  - .3 Submit warranties on form approved by *Owner* including, but not limited to, the following information:
    - .1 Name and address of Project.
    - .2 Warranty commencement date (date of *Substantial Performance of the Work*).
    - .3 Duration of warranty.
    - .4 Clear indication of what is being warranted and what remedial action will be taken under warranty.
    - .5 Authorized signature and seal of company providing each warranty.
- .2 *Owner* shall be named in manufacturer's *Product* warranties. Submit on relevant *Product* manufacturer's standard warranty or guarantee form.

END OF SECTION

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## PART 1 – GENERAL

### 1.1 GENERAL REQUIREMENTS

- .1 Read and be governed by conditions of the *Contract* and sections of Division 1.
- .2 A commissioning team shall be established as required by the *Owner* for the Project that shall include representatives for the *Owner, Consultant, Commissioning Agent* (which may be designated *Owner's forces*), *Contractor* and *Subcontractors* involved with the systems to be commissioned.
- .3 A qualified *Commissioning Agent* (authority) shall be appointed by the *Owner* to oversee all *Commissioning* testing of systems. All prescribed forms shall be submitted by the *Contractors* to the *Commissioning Agent* and *Consultant* for approval prior to final submission to the *Owner*.
- .4 The *Contractor* shall be responsible for providing all necessary labour, equipment, representatives and testing apparatus required for the *Commissioning* process and shall coordinate with the commissioning team through the *Commissioning Agent* to ensure all designated systems are fully commissioned and operating to design requirements.
- .5 *Commissioning* as referred to in this section does not negate the *Contractor* from doing his specified start-up requirements. Both the *Consultant* and *Commissioning Agent* shall witness all start-up procedures. Written confirmation shall be provided by the *Contractor* to the *Consultant* and *Commissioning Agent* for the start-up of each piece of equipment for all designated systems.
- .6 *Commissioning* for includes the systems listed below or as applicable to this project and as instructed by the *Consultant*.
  - .1 Designated Mechanical Systems
    - .1 New Air Handling Unit and Ventilation System Components
      - .1 Tests on HVAC equipment will be executed during each of the heating, cooling and "shoulder" seasons (some overwriting of control values to simulate conditions may be allowed but only with written approval from the *Consultant*). Functional testing will need to be done using conventional manual methods, control system trend logs, and read-outs or standalone data loggers, to provide a high level of confidence in proper system function, as deemed appropriate by the *Commissioning Agent* and the Hospital.
    - .2 Heating System related to the new Air Handling Unit
    - .3 Cooling System related to the new Air Handling Unit
    - .4 Humidification and Dehumidification Systems related to the new Air Handling Unit
    - .5 Control System related to the new Air Handling Unit
    - .6 MRI Room Emergency Exhaust System and Components
    - .7 Cooling System for the MRI Equipment Room
    - .8 Motor Starters & Variable Frequency Drives for Mechanical Equipment
    - .9 Building Automation System Verification
    - .10 Pre-Action Sprinkler System Verification
    - .11 Specialty Mechanical Equipment
    - .12 Ventilation System Air Balancing Verification
    - .13 Heating Water System Air Balancing Verification
  - .2 Designated Electrical Systems may include but not limited to as follows:

- .1 Fire Alarm System Verification
- .2 Nurse Call System Verification
- .3 Security System Verification
- .4 Medical Equipment Power Conditioning Equipment Verification
- .5 Emergency Battery Lighting System Verification

## 1.2 PROCEDURES AND FORMATS

- .1 *Commissioning* shall consist of 'Start-Up', 'Verification' and 'Performance Testing'.
- .2 Start-Up procedures, as defined for this *Project*, entail confirmation that the *Contractor* has started-up all equipment and systems in accordance with the manufacturer's recommendations, operated the systems continuously for 48 hours under control, and started and stopped each piece of equipment at least (5) five times consecutively trouble free.
- .3 Verification forms shall be completed after start-up by the appropriate *Subcontractor* for the various systems to be commissioned. These shall be submitted to the *Commissioning Agent* and *Consultant* for approval prior to submission to the *Owner*. Forms shall be made available to the *Contractor* by the *Commissioning Agent* as required.
  - .1 The *Contractor* shall fill out and submit the matrix as part of the verification procedure.
  - .2 The forms shall be submitted complete with the related documentation in binder format.
  - .3 E.g. - The item "Keys" would be submitted with a copy of the transmittal form given to the 'Owner' with the data on the turnover (i.e. No. of Keys, Name of Equipment or Item concerned, Manufacturer of Equipment, Type of Lock, etc.)
- .4 The *Contractor* will assign an individual from each of their required *Subcontractors* to act as their respective representatives on the commissioning team. Other *Subcontractor* representation (e.g. Air and Water Balancer) shall be made available to the team as and if required by the *Commissioning Agent*.
- .5 Performance tests shall not be conducted until all associated systems and equipment are started-up and verified and the scenarios are developed and scheduled by the commissioning team.
- .6 The *Commissioning Agent* with the commissioning team will develop and coordinate the individual implementation of scenarios on the various components of a system or a whole system to confirm proper operation. The *Commissioning Agent* will submit to the *Contractor* in advance of the tests the scenarios to allow the *Contractor*, if needed, to arrange the required representatives and/ or personnel that will be needed for the test and also to allow the *Contractor* the time to confirm and arrange the required test equipment.
  - .1 The *Commissioning Agent* with *Consultant's* input will develop and provide the test sheets for the various systems and/or component testing.
  - .2 Refer to the CSA Standards indicated in article 1.2.14 for additional information on documentation.
- .7 The automation *Subcontractor* is to provide all required equipment and labour needed to confirm that the equipment and their sensors and/or monitors are reading correctly. The test equipment must be acceptable to the *Commissioning Agent* and the type of equipment to be used in the test must be reviewed at least one week in advance of the test with the *Commissioning Agent*. The *Subcontractor* must verify that the test equipment has been certified for calibration in the last three months. If there is disagreement about the accuracy of the test equipment the *Contractor* is to provide reliable proof that the test equipment is working and accurate. The BAC's must be calibrated prior to test use.

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- .8 Contractor is to cooperate with *Subcontractors* and ensure all required personnel and manufacturer's personnel needed to participate in the testing of the systems are provided.
  - .9 Re-adjustment, re-testing and re-balancing of system is to be done by the *Contractor(s)* should the test results be unacceptable to the *Commissioning Agent, Consultant, or Owner*.
  - .10 The *Contractor* will be responsible for informing the *Commissioning Agent* of all changes that have occurred in the *Work* so the *Commissioning Agent* is aware of what the final review is to include.
  - .11 The *Commissioning Agent* shall convene through the *Contractor* commissioning team meetings.
  - .12 The *Commissioning Agent* will submit periodic reports to the *Owner* on the progress of the testing and indicate to the *Owner* any unusual observations as a result of the testing.
  - .13 The *Contractor* shall set-up and schedule equipment and system demonstrations for the *Owner*. Confirm in writing that the *Owner's* representatives have a useable working knowledge of the systems and equipment after demonstrations are complete.
  - .14 The following guidelines and standards shall be edited and incorporated into the *Commissioning* process as decided by the *Commissioning Agent (Authority)* at the time of 'Final Test Form Production'.
    - .1 ASHRAE Guideline I –1989" Guideline for commissioning of HVAC Systems"
    - .2 C.S.A. Z318.0 Commissioning of Health Care Facilities"
    - .3 C.S.A. Z318.1 "Commissioning of HVAC Systems in Health Care Facilities"
    - .4 C.S.A. Z318.3 "Commissioning of Plumbing Systems in Health Care Facilities"
    - .5 C.S.A. Z318.4 "Commissioning of Fire Protection Systems in Health Care Facilities"
    - .6 C.S.A. Z318.5 "Commissioning of Electrical Equipment and Systems in Health Care Facilities"
    - .7 C.S.A. Z318.6 "Commissioning of Medical Gas Systems in Health Care Facilities"
    - .8 C.S.A. Z318.7 "Commissioning of Communication Systems in Health Care Facilities"

APPENDIX A

The following forms are examples of the types of forms that will be provided to *Subcontractors* to be filled out as part of the *Commissioning* process. The final forms will be specifically tailored to the equipment and/or systems that are to be commissioned for this project. The forms provided are only a sample and do not in any way confirm that this will be the limit of the forms.

Mechanical Matrix

Electrical Matrix

Air Systems	Air Distribution	--	Ductwork	Verification Check Sheet
		--	Access Doors	Verification Check Sheet
		--	Fire Dampers	Verification Check Sheet
		--	Fire Damper Schedule	Verification Check Sheet
		--	Prefilters	Performance Test Sheet
		--	Supply Fan	Verification Check Sheet
			(two pages)	
		--	Supply Fan	Performance Test Sheet
			(two pages)	
		--	Automatic Dampers	Verification Check Sheet
		--	Cooling Coils	Verification Check Sheet
		--	Cooling Coils	Performance Test Sheet
		--	Heating Coils	Verification Check Sheet
		--	Heating Coils	Performance Test Sheet
		--	Mixing Plenums	Verification Check Sheet
		--	Mixing Plenums	Performance Test Sheet
			(two sheets)	
Hot Water Heating System	H.W. Distribution	--	Piping c/w Auxiliaries	Verification Check Sheet
			(two sheets)	
		--	Reheat Coils	Verification Check Sheet
		--	Reheat Coils	Performance Test Sheet
	Pumps	--	Secondary Pumps	Verification Check Sheet
		--	Secondary Pumps	Performance Test Sheet
			(two sheets)	
Control Input Devices Systems		--	Elect. Temp. Sensor	Startup Check Sheet
		--	Elect. Temp. Sensor	Verification Check Sheet
		--	Elect. Temp. Sensor	Performance Test Sheet
		--	Pressure Switch	Startup Check Sheet
		--	Pressure Switch	Verification Check Sheet
		--	Pressure Switch	Performance Test Sheet
Electrical	Power and Lighting Panelboards	--	Panelboards	Startup Check Sheet
		--	Panelboards	Verification Check Sheet
	Starters	--	Var. Speed Controller	Performance Test Sheet
			(two sheets)	
	Communications	--	Security System	Startup Check Sheet
		--	Nurse Call	Verification Check Sheet
			(three sheets)	

END OF SECTION

**PART 1 GENERAL**

- 1.1 SECTION INCLUDES
- 1.2 RELATED SECTIONS
- 1.3 ALTERATION PROJECT PROCEDURES
- 1.4 ADMINISTRATIVE REQUIREMENTS
- 1.5 CLOSEOUT SUBMITTALS
- 1.6 REGULATORY REQUIREMENTS
- 1.7 PROJECT CONDITIONS

**PART 2 PRODUCTS**

**PART 3 EXECUTION**

- 3.1 PREPARATION
- 3.2 DEMOLITION



## **PART 1 GENERAL**

### **1.1 SECTION INCLUDES**

- .1 Alteration project procedures.
- .2 Removal of designated building equipment and fixtures.
- .3 Removal of designated construction.
- .4 Storage of removed materials.
- .5 Identification of utilities.

### **1.2 RELATED SECTIONS**

- .1 Section 01 20 10 – Prices: Alternate Price No. 2
- .2 Section 21 00 00 – Fire Suppression
- .3 Section 22 00 00 – Plumbing
- .4 Section 23 00 00 – Heating, Ventilating and Air Conditioning
- .5 Section 26 00 00 – Electrical
- .6 Section 27 00 00 – Communications
- .7 Section 28 00 00 – Electronic Safety and Security

### **1.3 ALTERATION PROJECT PROCEDURES**

- .1 Materials: As specified in Product sections; match existing Products and work for patching and extending work.
- .2 Employ skilled and experienced installer to perform alteration work.
- .3 Remove, cut, and patch Work in a manner to minimize damage and to provide means of restoring Products and finishes to original condition.
- .4 Refinish existing visible surfaces to remain in renovated rooms and spaces, to renewed condition for each material, with a neat transition to adjacent finishes.
- .5 Where new Work abuts or aligns with existing, provide a smooth and even transition. Patch Work to match existing adjacent Work in texture and appearance.
- .6 When finished surfaces are cut so that a smooth transition with new Work is not possible, terminate existing surface along a straight line at a natural line of division and submit recommendation to Consultant for review.

- .7 Where a change of plane of 6 mm (1/4 inch), submit recommendation for providing a smooth transition to Consultant for review.
- .8 Patch or replace portions of existing surfaces which are damaged, lifted, discoloured, or showing other imperfections.
- .9 Finish surfaces as specified in individual Product sections.

#### 1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Existing Conditions:
  - .1 Photograph existing spaces in sufficient detail to record conditions and stability before work of this Section commences. These photographs will be used to compare to condition of adjacent construction before and after performance of work of this Section should any damage to the adjacent construction occur. Submit all photographs to the Consultant prior to the commencement of the work.
- .2 Scheduling: Schedule work to requirements of Section 01 32 00.
  - .1 Describe demolition removal procedures and schedule.
- .1 Perform noisy, malodorous and dusty work:
  - .1 During hours acceptable to the Owner. Provide one week notice to owner in writing.

#### 1.5 CLOSEOUT SUBMITTALS

- .1 Section 01 33 00: Submission procedures.
- .2 Record Documentation: Accurately record actual locations of capped utilities and subsurface obstructions.

#### 1.6 REGULATORY REQUIREMENTS

- .1 Conform to applicable code for demolition work, dust control, and products requiring electrical disconnection.
- .2 Obtain required permits from authorities.
- .3 Do not close or obstruct egress width to any building or site exit.
- .4 Do not disable or disrupt building fire, life safety systems medical gas system and electrical power system without ten (10) days prior written notice to Owner
- .5 System disruptions affecting areas outside of the Area of Work requires six (6) week's notice in writing via the six-week detailed look ahead.
- .6 Conform to applicable regulatory procedures when discovering hazardous or contaminated materials.

## 1.7 PROJECT CONDITIONS

- .1 Conduct demolition to minimize interference with adjacent occupied building areas.
- .2 Cease operations immediately if structure appears to be in danger and notify Consultant. Do not resume operations until directed.

## PART 2 PRODUCTS

- .1 Not Used

## PART 3 EXECUTION

### 3.1 PREPARATION

- .1 Erect and maintain temporary partitions to prevent spread of dust, odours, and noise to permit continued Owner occupancy. Refer to Section 01 50 00 for requirements.
- .2 Protect existing materials and structures which are not to be demolished.
- .3 Prevent movement of structure; provide bracing and shoring.
- .4 Notify affected utility companies before starting work and comply with their requirements.
- .5 Mark location and termination of utilities.
- .6 Provide appropriate temporary signage including signage for exit or building egress.

### 3.2 DEMOLITION

- .1 Disconnect, remove, cap, and identify designated utilities within demolition areas.
- .2 Demolish in an orderly and careful manner. Protect existing supporting structural members
- .3 Remove demolished materials from site except where specifically noted otherwise. Do not burn or bury materials on site.
- .4 Remove materials as Work progresses. Upon completion of Work, leave areas in clean condition.
- .5 Remove temporary Work.

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 “Revised Limited Designated Substance Survey Report (Renovation Areas) Sunnybrook Health Sciences Centre, K1E Project,” Maple Project 16573 dated December 2017 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 First 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 Drawing AR-01.
  - .2 ACM vinyl sheet flooring must be assumed to be present below some partitions walls and millwork but is not indicated on Drawings.

Asbestos Abatement - Scope and Details

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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.

Asbestos Abatement - Scope and Details

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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.

Asbestos Abatement - Scope and Details

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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.

Asbestos Abatement - Scope and Details

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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.



Asbestos Abatement - Scope and Details

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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.

Asbestos Abatement - Scope and Details

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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.

Asbestos Abatement - Scope and Details

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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**

Type 2 Asbestos Abatement

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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.

Type 2 Asbestos Abatement

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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.

Type 2 Asbestos Abatement

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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.

Type 2 Asbestos Abatement

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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.

Type 2 Asbestos Abatement

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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:



Type 2 Asbestos Abatement

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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.

Type 2 Asbestos Abatement

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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***

Type 2 Asbestos Abatement

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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.

Type 2 Asbestos Abatement

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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**

Type 3 Asbestos Abatement

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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:

Type 3 Asbestos Abatement

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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.

Type 3 Asbestos Abatement

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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, aluminum 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.

Type 3 Asbestos Abatement

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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:



Type 3 Asbestos Abatement

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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.

Type 3 Asbestos Abatement

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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,

Type 3 Asbestos Abatement

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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.

Type 3 Asbestos Abatement

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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.

Type 3 Asbestos Abatement

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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.

Type 3 Asbestos Abatement

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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**



CONFIRMED ACM	DESCRIPTION
	VINYL SHEET FLOORING
	AREAS NOT TO BE PHASED BY PROPOSED REMEDIATION

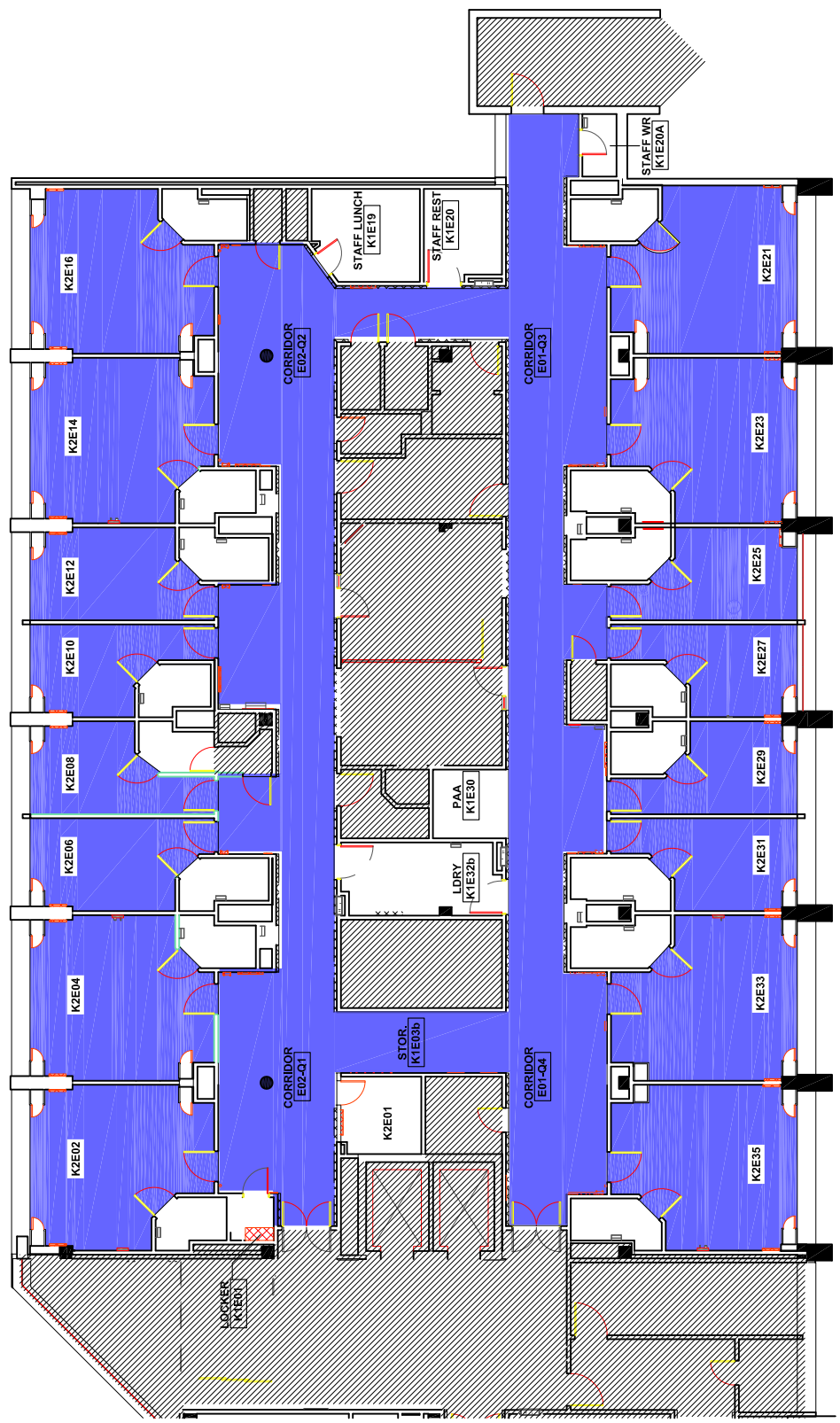
Asbestos Containing Materials are Assumed to be Present Above Ceiling within Rooms with No Access and/or Rooms with No Access Above Ceiling.



Drawn By: S. Russo  
 Checked By: Sunnybrook Health Sciences  
 S. Russo  
 2075 Bayview Avenue  
 Toronto, ON

**ASBESTOS REMOVAL**  
 Sunnybrook Health Sciences  
 K Wing  
 First Floor  
 East Pod

Project No.	18670	Sheet	
Date	JULY/2020	AR-01	
Scale	NTS		



- NOTE:**
- 1) Remove ACM vinyl sheet flooring as specified in Section 02 82 00.
  - 2) Project phasing specified elsewhere.

**LIMITED DESIGNATED SUBSTANCE SURVEY  
REPORT  
(RENOVATION AREAS)**



**K1E Project  
Sunnybrook Health Sciences Centre  
2075 Bayview Avenue  
Toronto, Ontario**

**Presented to:**  
Sunnybrook Health Sciences Centre  
2075 Bayview Avenue  
Toronto, Ontario  
M5N 3M5

Attention: Mr. Ray Annetta

**December 2017**

**Maple Project No. 16573**

## **EXECUTIVE SUMMARY**

Maple Environmental Inc. ('Maple') was retained by Sunnybrook Health Sciences Centre to perform a survey for Designated Substances as well as polychlorinated biphenyls (PCBs) and mould within the selected areas of the K Wing located at 2075 Bayview Avenue, Toronto, Ontario (the 'Site'). It is our understanding that the building requires a survey to identify possible hazardous building materials that may be disturbed during the renovations of the selected areas.

The survey was limited to: the K1E Project Area. The findings of the current survey are summarized below. Please refer to the main body of this report for details on all materials.

### **Asbestos**

Asbestos-containing materials (ACM) identified within the surveyed area at the time of the assessment are as follows:

- Vinyl Sheet Flooring

It should be noted that due to the presence of solid walls and ceilings (i.e. cinder block walls and above solid ceilings) throughout the survey area, access for viewing within the wall and ceiling cavities was not always possible. Suspect asbestos-containing materials may be present within wall and ceiling cavities that were not identified but are suspected to be present in this report. Caution should be taken when demolishing solid walls and ceilings within the areas being surveyed.

### **Lead**

Based on the Laboratory Analysis Report for lead samples and visual confirmation observation made during the fieldwork:

- Three (3) bulk samples were collected of the predominant paint colours and the results indicated that the white and peach paints are considered to be lead-based paints, and the teal paint is considered to be low level lead (virtually safe).
- It should be noted that lead may also be present in wiring connectors, electric cable sheathing, solder joints on copper piping, ceramic glazes, lead sheeting, masonry mortar, and as sub-surface layers to the most recent paint layers currently applied, where present at the Site.

### **Mercury**

- Mercury vapour is present in all fluorescent light tubes.

### **Silica**

- Free crystalline silica, present as common construction sand, is present in all concrete and masonry products where present within the surveyed areas.

### **Mould**

- No visible mould growth was observed to be present within the building at the time of the assessment.

- It is possible that mould growth is present in concealed areas such as wall or ceiling cavities, pipe chases, etc. or in areas not currently assessed by Maple. The client should notify Maple should any water damage or suspect mould growth be discovered.

### **PCBs**

- The fluorescent lamp fixtures observed within the surveyed area could contain a combination of T8 and T12 fluorescent light tubes. T12 fixtures are older fixtures and have the potential of using PCB-containing ballast. T8 fixtures have electronic ballast and are considered as not containing PCB.
- No transformers were observed within the surveyed area.

### **Recommendations**

Based on the Laboratory Analytical Results and observations made on Site, Maple provides the following recommendations.

- Remove asbestos-containing materials that may be disturbed during the planned renovation using the appropriate asbestos abatement procedures as outlined in Section 5.0.
- Low Level Lead paints (0.1% or less) are considered virtually safe provided that;
  - airborne lead concentrations are kept below 0.05 mg/m<sup>3</sup>
  - general dust suppression and worker hygiene procedures are utilized
  - torching or other activities that create fumes are not completed
- Disturbance of paints that are considered Lead-Containing or Lead-Based should be completed using Lead abatement procedures as appropriate in accordance with EACO and Ministry of Labour Guidelines and are generally as follows;
  - Class 1 Lead abatement procedures (removing paint by means of chemical stripper or heat gun, removal of lead sheeting),
  - Class 2A Lead abatement procedures (removal of lead paint using power tools equipped with HEPA vacuum attachment, removal by scraping or sanding using non-powered hand tools, or manual demolition of plaster finishes)
  - Class 3A Lead abatement procedures (removal using power tools, welding or torching,
  - Class 3B Lead abatement procedures (for abrasive blasting).
- Further, prior to disposal it is recommended that materials containing lead should be sampled and analyzed for Metals/Inorganics using the Toxicity Characteristic Leaching Procedure (TCLP) as described under O. Reg. 347. The testing is required to determine waste classification in accordance with Ontario Regulation 347 of R.R.O. 1990 made under the Environmental Protection Act amending Reg. 558/00.

- Remove all mercury containing components (including fluorescent light tubes) prior to renovations if the materials are being removed. These components should be removed intact and disposed of appropriately.
- Proper dust suppression techniques and other safety precautions to control possible generation of silica dust from the demolition of concrete and masonry products present in the building should follow those outlined in the Ministry of Labour Guideline- Silica on Construction Projects, 2004.
- Should light fixtures containing ballasts be removed as part of the project, all ballasts not clearly marked as "non-PCB" on the label should be separated, handled and disposed of as PCB-containing or inspected by competent persons to ascertain PCB content.

Appropriate procedures for asbestos, lead, mercury, silica, mould and PCBs must be observed if these materials are likely to be disturbed by scheduled renovations. Please refer to Section 5.0 of the report to review the required procedures.

Consideration should be given to assessing other areas of the building that could be associated with the current project, including travel path, mechanical or electrical ties in the areas outside of the immediate project area, and penetrations through the slab impacting floors below or above.

## TABLE OF CONTENTS

<b>1.0</b>	<b>INTRODUCTION.....</b>	<b>1</b>
<b>2.0</b>	<b>APPLICABLE ONTARIO REGULATIONS.....</b>	<b>1</b>
2.1	DESIGNATED SUBSTANCES AND OTHER HAZARDOUS MATERIALS .....	1
2.2	ONTARIO REGULATION 278/05 (ASBESTOS) .....	2
2.3	ONTARIO REGULATION 347 .....	2
2.4	ONTARIO REGULATION 362 .....	3
<b>3.0</b>	<b>SURVEY SCOPE AND METHODOLOGY.....</b>	<b>3</b>
3.1	ASBESTOS-CONTAINING BUILDING MATERIALS (ACM).....	3
3.2	LEAD.....	5
3.3	MERCURY .....	5
3.4	OTHER DESIGNATED SUBSTANCES.....	6
3.5	MOULD .....	6
3.6	POLYCHLORINATED BIPHENYLS.....	6
3.7	LIMITATIONS AND OMISSIONS FROM SCOPE.....	6
3.8	DRAWINGS .....	7
3.9	PREVIOUS REPORTS .....	7
<b>4.0</b>	<b>INVENTORY FINDINGS .....</b>	<b>7</b>
4.1	ASBESTOS .....	7
4.2	LEAD.....	12
4.3	MERCURY .....	13
4.4	SILICA .....	13
4.5	ISOCYANATES .....	13
4.6	VINYL CHLORIDE MONOMER.....	13
4.7	BENZENE.....	14
4.8	ACRYLONITRILE.....	14
4.9	COKE OVEN EMISSIONS .....	14
4.10	ARSENIC.....	14
4.11	ETHYLENE OXIDE .....	14
4.12	MOULD .....	14
4.13	POLYCHLORINATED BIPHENYLS (PCB).....	14
<b>5.0</b>	<b>RECOMMENDATIONS .....</b>	<b>14</b>
5.1	ASBESTOS .....	14
5.2	LEAD.....	15
5.3	MERCURY .....	15
5.4	SILICA .....	16
5.5	POLYCHLORINATED BIPHENYLS.....	16
<b>6.0</b>	<b>LIMITATIONS .....</b>	<b>16</b>
 <b><u>APPENDICES</u></b>		
<b>APPENDIX I</b>	LABORATORY ANALYSIS REPORT - ASBESTOS	
<b>APPENDIX II</b>	LABORATORY ANALYSIS REPORT - LEAD	
<b>APPENDIX III</b>	DRAWINGS	

## **1.0 INTRODUCTION**

Maple Environmental Inc. ('Maple') was retained by Sunnybrook Health Sciences Centre to perform a survey for Designated Substances as well as polychlorinated biphenyls (PCBs) and mould within selected areas of the K Wing located at 2075 Bayview Avenue, Toronto Ontario (the 'Site'). It is Maple's understanding that the building requires a survey to identify possible hazardous building materials that may be disturbed during the renovations of the areas surveyed.

Section 30 of the Ontario Occupational Health and Safety Act requires that the following Designated Substances be included in a Designated Substance Survey:

***Asbestos***

***Lead***

***Mercury***

***Silica***

***Isocyanates***

***Vinyl Chloride Monomer***

***Benzene***

***Acrylonitrile***

***Coke Oven Emissions***

***Arsenic***

***Ethylene Oxide***

Additional detailed information with respect to asbestos was collected at the time of the survey to ensure compliance with Ontario Regulation 278/05.

The assessment was performed by Kyle Prosser and Sarah Doyle of Maple on November 21, 2017.

## **2.0 APPLICABLE ONTARIO REGULATIONS**

Applicable Ontario Regulations for each of the materials included in the investigation are briefly described below.

### **2.1 Designated Substances and Other Hazardous Materials**

Section 30 of the Occupational Health and Safety Act requires building owners or their agents (architects, general contractors, etc.) to prepare or have prepared a Designated Substance report for specified potentially hazardous materials possibly present in a facility. The owner must ensure that a prospective constructor has received a Designated Substance report before entering into a binding contract with the contractor. The owner is liable to the contractor for damages and costs arising from unreported materials (of which the owner should reasonably have been aware), and could also be subject to orders and fines from the Ministry of Labour.

In addition to the requirements under the Occupational Health and Safety Act, Section 6 of the Ministry of Labour Regulations for Construction Projects requires the contractor, when submitting the Notice of Project form, report any Designated Substances likely to be used, handled or disturbed during the project.

The disturbance of asbestos materials on construction projects is controlled by Ministry of Labour Regulation R.R.O. 2005/278. The disposal of asbestos waste is controlled by Ministry of Environment Regulation, R.R.O. 1990/347.

There are no specific Ministry of Labour regulations for control of the other Designated Substances on construction projects. However, the Ministry of Labour actively enforces the general duty clause of the Health and Safety Act which protects

workers and provides guidance on exposure monitoring, permissible exposure levels, medical monitoring, etc. for all Designated Substances.

Although Regulations exist for many of the Designated Substances, they apply to industry settings using Designated Substances in manufacturing processes, and do not apply to general property management, renovation or maintenance of buildings.

Polychlorinated Biphenyls ("PCBs") and mould were also included in the investigation, which are not specifically named as Designated Substances. No specific regulations are attached to these materials, but are generally governed by the due diligence section of the Health and Safety Act for employers to protect their workers.

## **2.2 Ontario Regulation 278/05 (Asbestos)**

Ontario Regulation 278/05 applies to buildings with regards to maintenance, renovations or demolition work where asbestos-containing materials (ACM) is present and may be disturbed. The Regulation requires that a detailed asbestos inventory be performed in all buildings where friable and non-friable asbestos materials are present. The inventory must be available at the work place and must identify the type of asbestos, and location of asbestos on a room-by-room basis. The following report does not necessarily meet the requirements for an asbestos survey under Ontario Regulation 278/05.

In addition, the regulation requires all buildings where asbestos has been used as part of the building to implement an Asbestos Management Program (AMP).

The major requirements of the AMP include:

- Preparation and maintenance of an on-site record of where asbestos material is located;
- Written notification provided to tenants or lessees occupying space where asbestos is present;
- Advise workers of the owner, other staff and outside contractors of the presence and location of ACM;
- Institute and maintain a program for the training and instruction of every worker employed in the building that is likely to work in close proximity to and may disturb asbestos.
- Update the asbestos report (minimum annually)
- Preparation of written asbestos work practices;
- Repair or removal of all damaged asbestos where it may be disturbed; and
- Other record keeping.

## **2.3 Ontario Regulation 347**

Ontario Regulation 347 applies to the transport of waste from the location of generation to a landfill site authorized to receive specific wastes. The regulation also prescribes procedures on how the specific wastes are to be handled at the landfill site.



The major requirements of the building owner and the person(s) removing the waste are to ensure that:

- The waste is appropriately packaged and labelled;
- The transport vehicle is appropriately placard; and
- The waste is to be transported as directly as possible to the landfill site once it leaves the site.

Some wastes require the owner to register a Generator (of waste) number and many wastes require classification that can restrict or even prohibit their disposal in landfill.

It is important to note that the building owner can be held responsible for the waste until the waste disposal site accepts it.

## **2.4 Ontario Regulation 362**

Ontario Regulation 362, made under the Ontario Environmental Protection Act applies to the waste management and transport of PCB waste from the location of generation to a landfill site authorized to receive specific wastes. The regulation also prescribes procedures on how the specific wastes are to be handled at the landfill site.

## **3.0 SURVEY SCOPE AND METHODOLOGY**

The survey was limited to the K1E Project Area, as shown on Drawing DS-01-01 in Appendix III. The methodology included the assessment for hazardous materials and how the assessment was performed is outlined below.

In order to determine the location of materials included in the assessment, the project technologist entered the room where practical (i.e. where access was possible without the demolition of walls, roof or ceilings or destruction of flooring). Representative views were made above accessible suspended ceiling systems. Cavities within solid ceiling and wall systems were accessed via existing access panels only. The inventory did not include demolition of building systems or finishes to check on possible hidden conditions.

### **3.1 Asbestos-Containing Building Materials (ACM)**

The scope of the survey included all friable asbestos products and all major non-friable asbestos materials. The term friable is applied to a material that can be readily reduced to dust or powder by hand or moderate pressure. Asbestos materials that are friable have a much greater potential to release airborne asbestos fibres when disturbed.

Typical friable asbestos materials include: sprayed fireproofing or thermal insulation, textured (stippled) plaster, and thermal mechanical insulation. Typical non-friable materials include: asbestos cement (transite) products, vinyl floor tiles, asbestos textiles and gaskets. Additional materials such as ceiling tiles, drywall joint compounds and vinyl sheet flooring are classified as non-friable, but because of their ability to release dust when disturbed are considered as "potentially friable" for the purpose of this report.

Bulk samples of materials suspected to contain asbestos were collected for analysis during the survey. Specifically, a small volume of material was removed either from a damaged section of suspect material, or taken from intact material. In these latter cases, the material from which the sample was collected was sealed with tape to temporarily prevent fibre release. Samples were placed in plastic bags and sealed until receipt by an independent laboratory. To ensure quality results, the independent laboratory chosen successfully participates in an "Asbestos Proficiency Analytical Testing Program". As such, these independent laboratories are responsible for their findings.

Bulk samples were collected in accordance with regulatory sampling requirements and with sufficient frequency to obtain a general pattern of asbestos use within the building. Due to building renovations or modifications that may have occurred in the past, the consistency of the application of asbestos materials may not be uniform throughout the entire Site. It is important to note that without sampling each individual wall, pipe section, ceiling tile etc. it is not possible to identify the asbestos content of every material present in the selected areas. For this reason, visually similar materials are considered to be homogenous with those already sampled elsewhere in the building without additional analysis.

O. Reg. 278/05 prescribes that a minimum number of samples be collected of materials suspected to contain asbestos. These minimum sampling requirements are summarized in Table 1, below.

**Table 1 - Suspect ACM Bulk Sampling Requirements**

<b>Type of Material</b>	<b>Quantity of Material Present</b>	<b>Minimum # of Bulk Samples Required</b>
Surfacing Materials (i.e. sprayed fireproofing, drywall joint compound, texture coat, and plaster)	Up to 90 sq. m. (1000 sq. ft.)	3
	From 90 sq. m. (1000 sq. ft.) to 450 sq. m. (5000 sq. ft.)	5
	Greater than 450 sq. m. (5000 sq. ft.)	7
All other potential ACM	Any	3

Excluding surfacing materials, the laboratory was instructed to cease analysis within Sample Groups of homogenous materials when one of the samples in the group is found to contain asbestos. For example, if three samples of a type of vinyl floor tile are collected (as required by O. Reg. 278/05) and submitted for analysis and the first sample is positively identified as containing asbestos, the balance of the sample group is not analysed.

EMC Scientific Inc. ("EMC"), an independent laboratory, was selected to analyse the collected bulk suspect asbestos samples. EMC successfully participates in an "Asbestos Proficiency Analytical Testing Program" and as such, is responsible for its findings. EMC followed the Code of Practice for the identification of asbestos in bulk material, as detailed in O. Reg. 278/05. Bulk samples were analysed using the Polarized Light Microscopy ("PLM") Technique with Dispersion Staining. The identification of asbestos fibre in bulk material is based on a collective set of parameters dependent on the unique shape and crystallographic properties of each fibre as viewed through the

microscope. This method is useful for the qualitative identification of asbestos and the semi-quantitative determination of asbestos content in bulk materials expressed as a percent of projected area. The method identifies types of asbestos and also measures percent of asbestos as perceived by the analyst in comparison to standard area projections or trained experience.

The recommendations made as part of this report with respect to asbestos have taken into consideration: the condition and accessibility of the material, vibration, air movement, and general activities likely to occur within the vicinity of the ACM.

In each area or room inventoried, the technician recorded the quantity, condition (GOOD, FAIR, or POOR) of each suspect asbestos-containing material.

The definitions for condition and accessibility of the asbestos-containing items are as follows:

<b>GOOD</b>	Material is intact with no visible signs of damage.
<b>FAIR</b>	Material is visibly damaged but can be repaired.
<b>POOR</b>	Material is damaged beyond repair and likely needs to be removed.

Where ACM is found to be in GOOD condition and not likely to deteriorate or fall, the general recommendation would be to re-evaluate the condition of the material on an annual basis (required by O. Reg. 278/05). This recommendation can be subject to change if the material is located in a manner that persons untrained in asbestos awareness could physically damage it.

Where ACM is found to be damaged (i.e. FAIR or POOR condition), a recommendation to have the material cleaned-up, repaired, removed, enclosed, or encapsulated is offered. The recommendation will also indicate which asbestos procedure should be used to perform the remedial work (i.e. Type 1, Type 2, Type 3, or Glove Bag Removal Methods).

### **3.2 Lead**

The investigation included the collection and analysis of all major paint colour applications for the presence of lead in the paint. Other materials that possibly contain lead were identified by known historic use, where relevant. The lead in paint samples were analysed by EMSL Canada Inc. ("EMSL"), an independent laboratory, using atomic absorption spectrophotometry. EMSL is AIHA (American Industrial Hygiene Association) and NIOSH (National Institute of Occupational Safety and Health) accredited for this type of analysis. The Laboratory Analysis Report for lead in paint samples is included with this Report as Appendix II.

### **3.3 Mercury**

The assessment included a visual identification of fluorescent light tubes, switches, electrical controls, heating system thermostats, thermometers, and other components historically known to contain mercury.

### **3.4 Other Designated Substances**

Other materials listed in Section 1.0 of this Report were identified on a visual basis where present, as part of the current assessment. It should be noted that no manufacturing or heavy industrial activities are known by Maple to occur at the Site. Therefore, Designated Substances associated with these activities (i.e. those other than Asbestos, Lead, Mercury, and Silica) would not be expected to be present in the selected areas.

### **3.5 Mould**

The assessment for mould was conducted in accordance with standard industry practice as set out in the Canadian Construction Association (CCA) "Mould Guidelines for the Canadian Construction Industry" for a visual assessment. Although there are no regulatory requirements in Ontario for such an assessment, the CCA Guidelines, and similar guidelines from other agencies have been accepted as the industry standard by most experts, consultants, the Ontario Ministry of Labour, and the Canadian Construction Association.

All guidelines and protocols for mould investigations indicate that investigations should be performed largely on a visual basis with limited collection of bulk and/or air samples. The Ontario Ministry of Labour has consistently enforced the removal of all mould from buildings regardless of mould genus or species, and therefore bulk samples or air samples for confirmation of mould are not typically collected for investigative purposes where mould is visible.

### **3.6 Polychlorinated Biphenyls**

Manufacturers labels/codes collected from fluorescent lamp ballasts suspected of containing Polychlorinated Biphenyls ("PCBs") are compared with Environment Canada's document titled "Identification of Lamp Ballasts Containing PCBs", which identifies PCB-containing ballasts.

### **3.7 Limitations and Omissions from Scope**

Due to the nature of building construction some limitations exist as to the possible thoroughness of any building materials inventory. The field observations, measurements, and analysis are considered sufficient in detail and scope to form a reasonable basis for the findings presented in this report. Maple warrants that the findings and conclusions contained herein have been made in accordance with generally accepted evaluation methods in the industry and applicable regulations at the time of the performance of the inventory.

It is possible that conditions may exist which could not be reasonably identified within the scope of the inventory or which were not apparent during the Site investigation. Maple believes that the information collected during the investigation concerning the property is reliable. No other warranties are implied or expressed.

During a standard ACM inventory performed for the purposes of regulatory compliance, it is industry practice to exclude certain suspect asbestos-containing materials from sampling. These materials are often excluded from sampling due to the risk of compromising the health and safety of the technician, other building occupants, or the integrity of the systems with which these materials are associated. Examples of such materials include; elevator brakes, roofing felts and mastics, high

voltage wiring, mechanical packing and gaskets, underground services or piping, fire-doors, window caulking and levelling compound. Where observed, these materials were presumed to be ACM.

### 3.8 Drawings

Drawings included in Appendix III will indicate the locations of any major applications of an asbestos-containing material with the exception of mechanical insulations, drywall, plaster finishes and transite (which cannot be accurately depicted on drawings). The information depicted on the drawings is not to scale and is only meant to provide a general representation of the locations of asbestos-containing materials.

### 3.9 Previous Reports

Where possible, Maple utilized the observations and representative bulk sampling results from previous Survey Reports that were made available at the time of the survey. Maple utilized sampling data from the following sources:

- December 2016 – OHE Consultants Project No. 21215 – Asbestos Survey Report Annual Update 2016.

## 4.0 INVENTORY FINDINGS

The findings of the survey are presented separately below for each of the eleven Designated Substances as well as microbial growth (mould), and polychlorinated biphenyls. Asbestos is further detailed by typical applications of asbestos.

### 4.1 Asbestos

The following is a brief discussion of the extent to which ACM was identified in the surveyed area. The discussion is organized under the headings of materials that are generally suspected of containing asbestos. The sample numbers refer to the laboratory analysis report presented as Appendix I and summarised in Table 2 below. Twenty-six (26) bulk samples were collected for the determination of asbestos content and submitted to the lab to be analysed. Due to the presence of more than one phase of material in some of the original samples the laboratory may have performed multiple analyses for some samples. In addition, some of the samples may not have been analysed due to the positive confirmation of asbestos in a previous sample of the same material during analysis. As a result, a total of forty (40) samples were analyzed.

**Table 2 - Summary of Analysis of Asbestos Bulk Samples**

Sample No.	Room Name	Sample Description	Result
S01A	COR01-Q4	Drywall Joint Compound	ND
S01B	Reception (K1E30)	Drywall Joint Compound	ND
S01C	Patient Room (K2E25)	Drywall Joint Compound	ND
S01D	COR02-Q2	Drywall Joint Compound	ND
S01E	COR02-Q2	Drywall Joint Compound	ND
S01F	Lounge (K2E01)	Drywall Joint Compound	ND

<b>Sample No.</b>	<b>Room Name</b>	<b>Sample Description</b>	<b>Result</b>
S01G	Staff Lunch Room (K1E19)	Drywall Joint Compound	ND
S02A	Corridor (K2E05)	Grey Plaster	ND
		White Plaster	ND
S02B	COR02-Q1	Grey Plaster	ND
		White Plaster	ND
S02C	COR02-Q1	Grey Plaster	ND
		White Plaster	ND
S02D	Lounge (K2E01)	Grey Plaster	ND
		White Plaster	ND
S02E	Patient Room (K2E25)	Grey Plaster	ND
		White Plaster	ND
S02F	COR01-Q3	Grey Plaster	ND
		White Plaster	ND
S02G	COR02-Q2	Grey Plaster	ND
		White Plaster	ND
S03A	Reception (K1E30)	12x12 Dark Orange Fleck Vinyl Floor Tile	ND
		Yellow Mastic	ND
S03B	Staff Lunch Room (K1E19)	12x12 Dark Orange Fleck Vinyl Floor Tile	ND
		Yellow Mastic	ND
S03C	Staff Lunch Room (K1E19)	12x12 Dark Orange Fleck Vinyl Floor Tile	ND
		Yellow Mastic	ND
S04A	Reception (K1E30)	12x12 Pink Fleck Vinyl Floor Tile	ND
S04B	Staff Lunch Room (K1E19)	12x12 Pink Fleck Vinyl Floor Tile	ND
S04C	Reception (K1E30)	12x12 Pink Fleck Vinyl Floor Tile	ND
S05A	Reception (K1E30)	12x12 White with Green Fleck Vinyl Floor Tile	ND
S05B	South Storage Room	12x12 White with Green Fleck Vinyl Floor Tile	ND
		Yellow Mastic	ND
S05C	Northwest Storage Room	12x12 White with Green Fleck Vinyl Floor Tile	ND
S06A	Reception (K1E30)	12x12 Green Fleck Vinyl Floor Tile	ND
		Yellow Mastic	ND
S06B	South Storage Room	12x12 Green Fleck Vinyl Floor Tile	ND
		Yellow Mastic	ND
S06C	Northwest Storage Room	12x12 Green Fleck Vinyl Floor Tile	ND
		Yellow Mastic	ND

Vinyl sheet flooring was previously sampled by Others, and confirmed to contain asbestos. Details for all confirmed asbestos-containing materials are presented below under the headings of the most typical asbestos applications in buildings.

It should be noted that due to the presence of solid walls and ceilings (i.e. cinder block walls and above solid ceilings) throughout the survey area, access for viewing within the wall and ceiling cavities was not always possible. Suspect asbestos-containing materials may be present within wall and ceiling cavities that were not identified but are suspected to be present in this report. Caution should be taken when demolishing solid walls and ceilings within the areas being surveyed.

#### **4.1.1 Sprayed Fireproofing**

No sprayed fireproofing was observed within the surveyed area at the time of the current assessment.

#### **4.1.2 Thermal Mechanical Insulation (Friable)**

Non-asbestos mechanical insulations are present throughout the surveyed area.

##### **Piping Systems:**

No asbestos-containing pipe systems were identified within the surveyed area at the time of the assessment.

Pipe systems observed within the surveyed area were either not insulated or were insulated with fibreglass, which is not suspected to contain asbestos.

##### **Pipe Fittings:**

All pipe fittings observed within the surveyed area were either insulated with non-asbestos fibreglass or were un-insulated.

##### **Pipe Straights:**

All pipe straights observed within the surveyed area were either insulated with non-asbestos fibreglass or were un-insulated.

##### **Duct Systems**

Duct systems observed within the surveyed area were observed to be either un-insulated or were insulated with foil-face fibreglass insulation which is not suspected to contain asbestos.

##### **Mechanical Equipment**

Mechanical equipment was observed to be externally un-insulated.

#### **4.1.3 Texture Finish (Friable)**

No textured finishes were observed within the surveyed area at the time of the current assessment.

#### **4.1.4 Acoustic Ceiling Tiles (Potentially Friable)**

No asbestos-containing acoustic ceiling tile systems were identified within the surveyed area at the time of the assessment.

One (1) visually distinct types of ceiling tile system was observed within the surveyed area. A brief description of the ceiling tile is outlined below.

- AT-01 (2x4 Pinhole):

No bulk samples of AT-01 were collected as a date stamp manufacture code was present on the backside of the tile indicating that the tiles were recently manufactured and therefore not suspected to contain asbestos.

#### **4.1.5 Vinyl Sheet Flooring (Potentially Friable)**

Asbestos-containing vinyl sheet flooring finishes were identified within the surveyed area at the time of the current assessment.

Two (2) visually distinct types of vinyl sheet flooring finishes were observed within the surveyed area. A brief description of each type of flooring is outlined below.

- VSF-01 (Brown and Tan Flecks)

VSF-01 was observed to be present throughout the surveyed area.

No bulk samples of the vinyl sheet flooring were collected at the time of the current survey as the material was previously sampled by Others, and was found to contain asbestos.

VSF-01 was observed to be in GOOD condition at the time of the survey.

- VSF-02 (Beige)

VSF-02 was observed to be limited to the east Staff Washroom (K1E20A), adjacent the staircase.

No bulk samples of VSF-02 were collected at the time of the current survey as building personnel notified Maple that the flooring was recently installed, and therefore not suspected to contain asbestos.

#### **4.1.6 Vinyl Floor Tile (Non-Friable)**

No asbestos-containing vinyl floor tile systems were identified within the surveyed area at the time of the current assessment.



Four (4) visually distinct types of vinyl floor tiles systems were observed within the surveyed area. A brief description of each type of vinyl floor tile is outlined below.

- VFT-01 (12x12 Dark Orange Fleck)

Three (3) representative samples (Sample Set S03A-C) of VFT-01 were collected and analyzed for determination of asbestos content. Analysis of

Sample Set S03 found that the samples do not contain asbestos. Yellow mastic associated with the tile was also analyzed as part of the sample set and was found not to contain asbestos.

- VFT-02 (12x12 Pink Fleck)

Three (3) representative samples (Sample Set S04A-C) of VFT-02 were collected and analyzed for determination of asbestos content. Analysis of Sample Set S04 found that the samples do not contain asbestos.

- VFT-03 (12x12 White with Green Fleck)

Three (3) representative samples (Sample Set S05A-C) of VFT-03 were collected and analyzed for determination of asbestos content. Analysis of Sample Set S05 found that the samples do not contain asbestos. Yellow mastic associated with the tile was also analyzed as part of the sample set and was found not to contain asbestos.

- VFT-04 (12x12 Green Fleck)

Three (3) representative samples (Sample Set S06A-C) of VFT-04 were collected and analyzed for determination of asbestos content. Analysis of Sample Set S06 found that the samples do not contain asbestos. Yellow mastic associated with the tile was also analyzed as part of the sample set and was found not to contain asbestos.

#### **4.1.7 Asbestos Cement Products "Transite" (Non-Friable)**

No Transite cement products were observed within the surveyed area at the time of the current assessment.

#### **4.1.8 Drywall Joint Compound (DJC) (Potentially Friable)**

No asbestos-containing drywall joint compound was identified within the surveyed area at the time of the current assessment.

Interior drywall finishes were present in the form of wall and ceiling finishes throughout the surveyed area.

Seven (7) representative samples (Sample Set S01A-G) of drywall joint compound were collected and analyzed for determination of asbestos content. Analysis of Sample Set S01 found that the samples do not contain asbestos.

While sample results indicated all drywall joint compound sampled within the surveyed area do not contain asbestos, it should be noted that the concentration of asbestos within drywall joint compound is historically known to be potentially inconsistently distributed. Further, it is possible that various phases of construction and renovations have occurred at the Site. Therefore, the number of samples collected may not be representative of all drywall joint compound finishes on Site. Prior to the disturbance of any drywall finishes, it is recommended that additional area specific bulk samples be collected.

Should drywall joint compound be identified in rooms not accessed by Maple, collection and analysis of the drywall joint compound is required.

#### **4.1.9 Plaster (Potentially Friable)**

No asbestos-containing plaster finishes were identified within the surveyed area at the time of the current assessment.

White plaster finishes were observed to be present in the form of wall finishes within select locations in the surveyed area.

Seven (7) representative samples (Sample Set S02A-G) of white plaster finishes were collected and analyzed for determination of asbestos content. Analysis of Sample Set S02 found that the samples do not contain asbestos. A grey plaster layer was also analysed as a part of the sample set and found not to contain asbestos.

While sample results indicated all plaster finishes sampled within the surveyed area do not contain asbestos, note that the concentration of asbestos within plaster is historically known to be potentially inconsistently distributed. Further, it is possible that various phases of construction and renovations have occurred at the Site. Therefore, the number of samples collected may not be representative of all plaster finishes on Site. Prior to the disturbance of any plaster finishes, it is recommended that additional area specific bulk samples be collected.

Should plaster finishes be identified in rooms not accessed by Maple, collection and analysis of the plaster is required.

#### **4.1.10 Vermiculite (Friable)**

No vermiculite insulation was observed to be present within the surveyed area at the time of the current assessment. It should be noted that loose fill vermiculite insulation can often be present within voids of masonry and possibly some pre-manufactured building components that would not be identified during the course of this assessment.

#### **4.2 Lead**

Three (3) bulk paint samples were collected for determination of lead content and submitted to EMSL for analysis during the assessment. The sample number refers to the Certificate of Analysis Report presented as Appendix II and summarised in Table 3 below.

**Table 3 - Summary of Analysis of Lead-in-Paint Samples**

Sample No.	Locations	Sample Description	Result (%)
Pb01	Walls and Ceilings	White Paint	1.3%
Pb02	Walls	Peach Paint	0.85%
Pb03	Trim	Teal Paint	0.059%

No regulations currently exist in Ontario defining the lower limit of lead-containing material. The Ontario Ministry of Labour (MOL) has issued a guideline for lead abatement, entitled Guideline – Lead on Construction Projects (2004) which is considered enforceable. The Guideline does not specify what constitutes a material as “lead-containing”. Instead, it outlines procedures based on the concentration of airborne lead encountered during removal, as well as provides procedures and/or specific operations for lead-containing material removal. However, the Environmental Abatement Council of Ontario (EACO) Lead Guideline for Construction, Renovation, Maintenance or Repair document classifies paint as either Low-Level, Lead-Containing, or Lead-Based as follows:

<b>TABLE 3 EACO Classification of Lead Paint</b>	
<b>Concentration of Lead (%)</b>	<b>Definition</b>
0.1 or less	Low Level Lead (Virtually Safe)
Greater than 0.1 but less than 0.5	Lead-Containing
0.5 or greater	Lead-Based

Based on these criteria and the results of the sample analysis, white and peach paint are considered Lead-based and teal paint is considered to be Low-Level Lead (virtually safe).

#### 4.3 Mercury

Mercury vapour is present in all fluorescent light tubes.

#### 4.4 Silica

Free crystalline silica, present as common construction sand, is present in all concrete and masonry products where present in the Select areas surveyed.

#### 4.5 Isocyanates

Free isocyanate compounds would not be expected to be found in a non-manufacturing facility.

#### 4.6 Vinyl Chloride Monomer

Vinyl chloride monomer would not be expected to be found in a non-manufacturing facility.

#### **4.7 Benzene**

Benzene would not be expected to be found in a non-manufacturing facility.

#### **4.8 Acrylonitrile**

Acrylonitrile would not be expected to be found in a non-manufacturing facility.

#### **4.9 Coke Oven Emissions**

Coke oven emissions would not be expected to be found in a non-manufacturing facility.

#### **4.10 Arsenic**

Arsenic would not be expected to be found in a non-manufacturing facility.

#### **4.11 Ethylene Oxide**

Ethylene oxide would not be expected to be found in a non-manufacturing facility.

#### **4.12 Mould**

No mould growth was observed within the surveyed area at the time of the current assessment.

It is possible that mould growth is present in concealed areas such as wall or ceiling cavities, pipe chases, etc. or in areas not currently assessed by Maple. The client should notify Maple should any water damage or suspect mould growth be discovered.

#### **4.13 Polychlorinated Biphenyls (PCB)**

The fluorescent lamp fixtures observed within the surveyed area could contain a combination of T8 and T12 fluorescent light tubes. T12 fixtures are older fixtures and have the potential of using PCB-containing ballast. T8 fixtures have electronic ballast and are considered as not containing PCB.

No transformers were observed within the surveyed area,

### **5.0 RECOMMENDATIONS**

#### **5.1 Asbestos**

Asbestos-containing materials within the surveyed area are limited to vinyl sheet flooring.

It is important to note that due to the presence of solid wall and ceiling systems, the assessment was not able to confirm or deny the presence of ACM mechanical insulations or vermiculite within wall and ceiling cavities. The presence of concealed

ACM should be assumed as well as within rooms that were not accessible during the assessment. It is possible that ACM is present that was not identified in this report. Further, caution should be taken when entering or demolishing solid building finishes as ACM mechanical insulation or vermiculite may be present.

Removal of the ACM vinyl sheet flooring will require the use of Type 3 Asbestos procedures, as it has been our experience in this facility that power tools (grinders) are required to adequately remove the ACM.

## **5.2 Lead**

Low Level Lead paints (0.1% or less) are considered virtually safe provided that;

- airborne lead concentrations are kept below 0.05 mg/m<sup>3</sup>
- general dust suppression and worker hygiene procedures are utilized
- torching or other activities that create fumes are not completed

White and peach paints are lead-based. Follow appropriate procedures if disturbed or removed.

Disturbance of paints that are considered Lead-Containing or Lead-Based should be completed using Lead abatement procedures as appropriate in accordance with EACO and Ministry of Labour Guidelines and are generally as follows;

- Class 1 Lead abatement procedures (removing paint by means of chemical stripper or heat gun, removal of lead sheeting),
- Class 2A Lead abatement procedures (removal of lead paint using power tools equipped with HEPA vacuum attachment, removal by scraping or sanding using non-powered hand tools, or manual demolition of plaster finishes)
- Class 3A Lead abatement procedures (removal using power tools, welding or torching,
- Class 3B Lead abatement procedures (for abrasive blasting).

Further, prior to disposal it is recommended that materials containing lead should be sampled and analyzed for Metals/Inorganics using the Toxicity Characteristic Leaching Procedure (TCLP) as described under O. Reg. 347. The testing is required to determine waste classification in accordance with Ontario Regulation 347 of R.R.O. 1990 made under the Environmental Protection Act amending Reg. 558/00.

## **5.3 Mercury**

Mercury vapour is present in all fluorescent light tubes. All fluorescent light tubes should be handled and disposed of appropriately.

#### **5.4 Silica**

Proper dust suppression techniques and other safety precautions to control possible generation of silica dust from the demolition of concrete and masonry products present in the building should follow those outlined in the Ministry of Labour Guideline- Silica on Construction Projects, 2004.

#### **5.5 Polychlorinated Biphenyls**

Prior to disposal, all fluorescent lamp ballasts should be inspected and compared with Environment Canada's document titled "Identification of Lamp Ballasts Containing PCBs" for the presence of PCB's.

### **6.0 LIMITATIONS**

Due to the nature of building construction some limitations exist as to the possible thoroughness of the subject investigation. The field observations are considered sufficient in detail and scope to form a reasonable basis for the findings presented in this report. Maple warrants that the findings and conclusions contained herein have been made in accordance with generally accepted evaluation methods in the industry and applicable regulations at the time of the performance of the assessment.

It is possible that conditions may exist which could not be reasonably identified within the scope of the investigation or which were not apparent during the site investigation. Maple believes that the information collected during the investigation period concerning the property is reliable. No other warranties are implied or expressed.

Information provided by Maple is intended for Client use ONLY. Any use by a third party, of reports or documents authored by Maple, or any reliance by a third party on or decisions made by a third party based on the findings described in said documents, is the sole responsibility of such third parties. Maple accepts no responsibility for damages suffered by any third party as a result of decisions made or actions conducted.

The liability of Maple or its staff will be limited to the lesser of the fees paid or actual damages incurred by the Client. Maple will not be responsible for any consequential or indirect damages. Maple will only be liable for damages resulting from negligence of Maple; all claims by the Client shall be deemed relinquished if not made within two years after last date of services provided.

Please contact Maple Environmental Inc. at (905) 257-4408 for inquiries regarding this project.

**MAPLE Environmental Inc.  
Environment, Health & Safety Consultants**

**Prepared By:**

**Reviewed By:**



**Sarah Doyle  
Project Technologist**

**Kyle Prosser  
Senior Project Manager**

C:\Users\Sarah Doyle\Google Drive\16500 - 16599\16573 Sunnybrook, K1E, Dsub\Report\16573, Sunnybrook, K WING, Limited DSUB Report.doc

# **APPENDIX I**

## **LABORATORY ANALYSIS REPORT - ASBESTOS**



To:

**Sarah Doyle**  
 Maple Environmental Inc.  
 482 South Service Road East, Suite 116  
 Oakville, Ontario  
 L6J 2X6

**EMC LAB REPORT NUMBER:** A35616

**Job/Project Name:** Sunnybrook – K Wing

**Analysis Method:** Polarized Light Microscopy – EPA 600

**Date Received:** Nov 21/17      **Date Analyzed:** Nov 27/17

**Analysts:** Jayoda Perera, *Analyst* & Arabee Sathiaseelan, *Laboratory Supervisor*

**Reviewed By:** Fajun Chen, Ph.D., *Laboratory Director*

**Job No:** 16573

**Number of Samples:** 26

**Date Reported:** Nov 28/17



Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)		
				Asbestos Fibres	Non-asbestos Fibres	Non-fibrous Material
S01A	A35616-1	Drywall Joint Compound, COR01-Q4	Off-white, joint compound	ND		100
S01B	A35616-2	Drywall Joint Compound, Reception (K1E30)	White and off-white, joint compound	ND		100
S01C	A35616-3	Drywall Joint Compound, Patient Room (K2E25)	White, joint compound	ND		100
S01D	A35616-4	Drywall Joint Compound, COR02-Q2	White and off-white, joint compound	ND		100
S01E	A35616-5	Drywall Joint Compound, COR02-Q2	White and off-white, joint compound	ND		100
S01F	A35616-6	Drywall Joint Compound, Lounge (K2E01)	Off-white, joint compound	ND		100
S01G	A35616-7	Drywall Joint Compound, Staff Lunch (K1E19)	White and off-white, joint compound	ND		100
S02A	A35616-8	Plaster, Corridor (K2E05)	2 Phases: a) Grey, plaster b) White, plaster	ND ND		100 100
S02B	A35616-9	Plaster, COR02-Q1	2 Phases: a) Grey, plaster b) White, plaster	ND ND		100 100
S02C	A35616-10	Plaster, COR02-Q1	2 Phases: a) Grey, plaster	ND		100

**EMC LAB REPORT NUMBER:** A35616

**Client's Job/Project No.:** 16573

**Analysts:** Jayoda Perera, *Analyst* & Arabee Sathiaseelan, *Laboratory Supervisor*

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)		
				Asbestos Fibres	Non-asbestos Fibres	Non-fibrous Material
			b) White, plaster	ND		100
S02D	A35616-11	Plaster, Lounge (K2E01)	2 Phases: a) Grey, plaster b) White, plaster	ND ND		100 100
S02E	A35616-12	Plaster, Patient Room (K2E25)	2 Phases: a) Grey, plaster b) White, plaster	ND ND		100 100
S02F	A35616-13	Plaster, COR01-Q3	2 Phases: a) Grey, plaster b) White, plaster	ND ND		100 100
S02G	A35616-14	Plaster, COR02-Q2	2 Phases: a) Grey, plaster b) White, plaster	ND ND		100 100
S03A	A35616-15	12x12 Dark Orange Fleck VFT, Reception (K1E30)	2 Phases: a) Orange, vinyl floor tile b) Yellow, mastic	ND ND		100 100
S03B	A35616-16	12x12 Dark Orange Fleck VFT, Staff Lunch Room (K1E19)	2 Phases: a) Orange, vinyl floor tile b) Yellow, mastic	ND ND		100 100
S03C	A35616-17	12x12 Dark Orange Fleck VFT, Staff Lunch Room (K1E19)	2 Phases: a) Orange, vinyl floor tile b) Yellow, mastic	ND ND		100 100
S04A	A35616-18	12x12 Pink Fleck VFT, Reception (K1E30)	Pink, vinyl floor tile	ND		100
S04B	A35616-19	12x12 Pink Fleck VFT, Staff Lunch Room (K1E19)	Pink, vinyl floor tile	ND		100

**EMC LAB REPORT NUMBER:** A35616

**Client's Job/Project No.:** 16573

**Analysts:** Jayoda Perera, *Analyst* & Arabee Sathiaseelan, *Laboratory Supervisor*

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)		
				Asbestos Fibres	Non-asbestos Fibres	Non-fibrous Material
S04C	A35616-20	12x12 Pink Fleck VFT, Reception (K1E30)	Pink, vinyl floor tile	ND		100
S05A	A35616-21	12x12 White with Green Fleck VFT, Reception (K1E30)	White, vinyl floor tile	ND		100
S05B	A35616-22	12x12 White with Green Fleck VFT, South Storage Room	2 Phases: a) White, vinyl floor tile b) Yellow, mastic	ND ND		100 100
S05C	A35616-23	12x12 White with Green Fleck VFT, Northwest Storage Room	White, vinyl floor tile	ND		100
S06A	A35616-24	12x12 Green Fleck VFT, Reception (K1E30)	2 Phases: a) Green, vinyl floor tile b) Yellow, mastic	ND ND		100 100
S06B	A35616-25 <sup>5</sup>	12x12 Green Fleck VFT, South Storage Room	2 Phases: a) Green, vinyl floor tile b) Yellow, mastic	ND ND		100 100
S06C	A35616-26 <sup>5</sup>	12x12 Green Fleck VFT, Northwest Storage Room	2 Phases: a) Green, vinyl floor tile b) Yellow, mastic	ND ND		100 100

**Note:**

1. Bulk samples are analyzed using Polarized Light Microscopy (PLM) and dispersion staining techniques. The analytical procedures are in accordance with EPA 600/R-93/116 method.
2. The results are only related to the samples analyzed. **ND** = None Detected (no asbestos fibres were observed), **NA** = Not Analyzed (analysis stopped due to a previous positive result).
3. This report may not be reproduced, except in full without the written approval of EMC Scientific Inc. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. Government.
4. The Ontario Regulatory Threshold for asbestos is 0.5%. The limit of quantification (LOQ) is 0.5%.
5. Phase b) is small in size
6. Vinyl floor tiles may contain very fine asbestos fibres which the PLM method cannot detect. TEM analysis may be necessary to confirm the absence of asbestos.

## **APPENDIX II**

### **LABORATORY ANALYSIS REPORT – LEAD**

**EMSL Canada Inc.**

2756 Slough Street, Mississauga, ON L4T 1G3

Phone/Fax: 289-997-4602 / (289) 997-4607

<http://www.EMSL.com>[torontolab@emsl.com](mailto:torontolab@emsl.com)

EMSL Canada Or 551712934

CustomerID: 55MAPL78

CustomerPO: 16573

ProjectID:

Attn: **Sarah Doyle**  
**Maple Environmental, Inc.**  
**482 South Service Road East**  
**Suite 116**  
**Oakville, ON L6J 2X6**

Phone: (905) 257-4408  
 Fax: (905) 257-8865  
 Received: 11/21/17 1:32 PM  
 Collected: 11/21/2017

Project: 16573-Sunnybrook K Wing

**Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)\***

<i>Client Sample Description</i>	<i>Lab ID</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Lead Concentration</i>
Pb01	551712934-0001	11/21/2017	11/22/2017	1.3 % wt
Site: White Paint, Corridor				
Pb02	551712934-0002	11/21/2017	11/22/2017	0.85 % wt
Site: Peach Paint, Corridor				
Pb03	551712934-0003	11/21/2017	11/22/2017	0.059 % wt
Site: Teal Paint, Corridor				

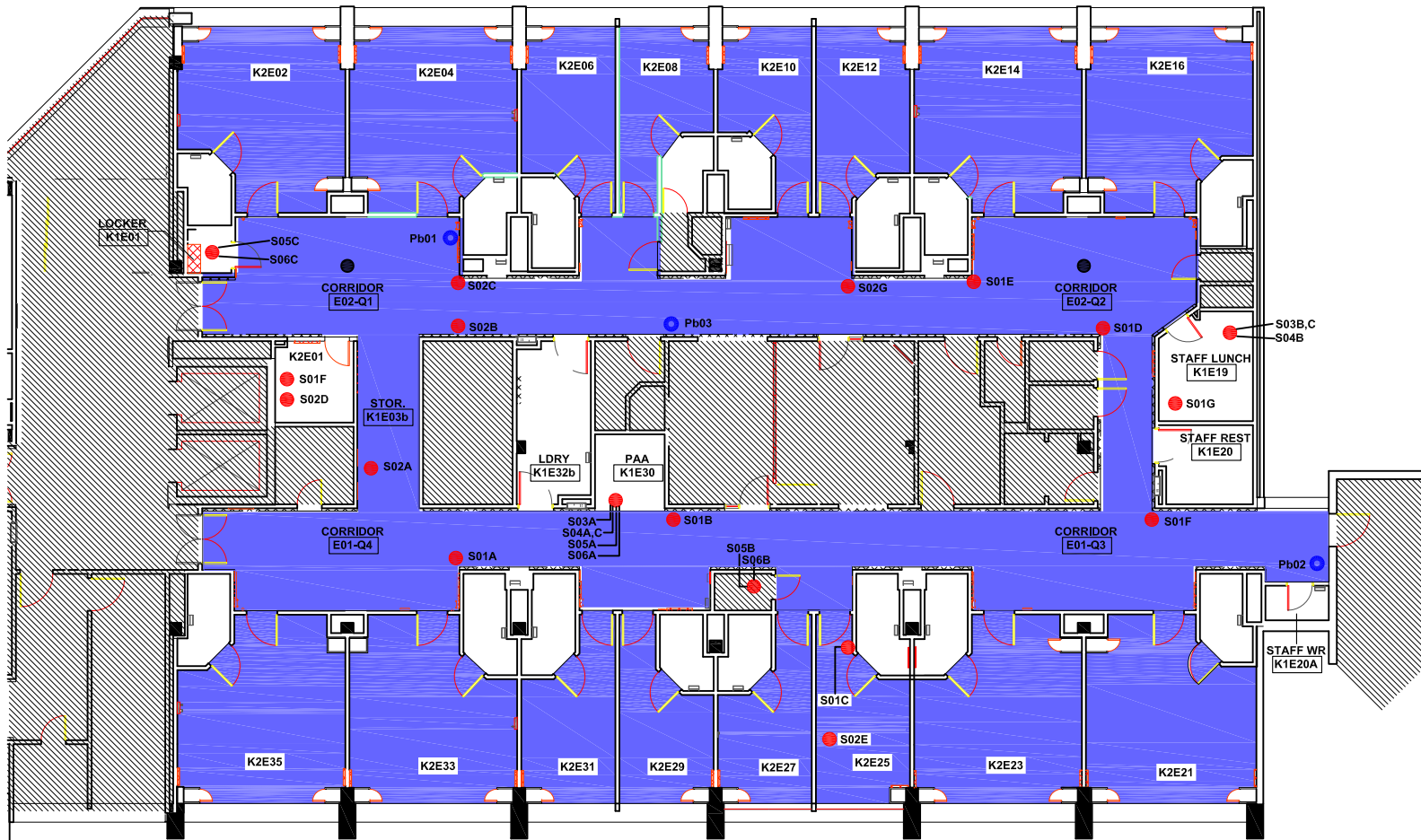
Rowena Fanto, Lead Supervisor  
 or other approved signatory

\*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements unless specifically indicated otherwise. Definitions of modifications are available upon request.

Samples analyzed by EMSL Canada Inc. Mississauga, ON A2LA Accredited Environmental Testing Cert #2845.08

Initial report from 11/28/2017 08:12:04

**APPENDIX III**  
DRAWINGS



**MAPLE ENVIRONMENTAL INC.**  
 ENVIRONMENT, HEALTH & SAFETY CONSULTANTS  
 402 South Service Rd. E. - Suite 116 - Oakville - Ontario - L6A 2W9  
 Tel: 905 257 4408 - Fax: 905 257 8865  
 www.MapleEnvironmental.com  
 OAKVILLE

BULK ASBESTOS SAMPLE SXXX	●
BULK PAINT SAMPLE PbXX	●

CONFIRMED ACM	
SYMBOL	DESCRIPTION
	VINYL SHEET FLOORING
	AREAS NOT TO BE DISTURBED BY PROPOSED RENOVATIONS

Asbestos Containing Materials are Assumed to be Present Above Ceiling within Rooms with No Access and/or Rooms with No Access Above Ceiling.

Drawn By: S. Doyle	Chkd By: K. Prosser	Sunnybrook Health Sciences 2075 Bayview Avenue Toronto, ON
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**DESIGNATED SUBSTANCE SURVEY**  
 Sunnybrook Health Sciences  
 K Wing  
 First Floor, East Pod

Project No. 16573	Sheet
Date DECEMBER/2017	DS-01-01
Scale NTS	

**PART 1 GENERAL**

- 1.1 SECTION INCLUDES
- 1.2 RELATED SECTIONS
- 1.3 REFERENCES
- 1.4 SUBMITTALS FOR REVIEW
- 1.5 SUBMITTALS FOR INFORMATION
- 1.6 CLOSEOUT SUBMITTALS
- 1.7 QUALITY ASSURANCE

**PART 2 PRODUCTS**

- 2.1 MATERIALS - STEEL
- 2.2 MATERIALS - ALUMINUM
- 2.3 DOOR FRAMING AND SCREEN BRACING
- 2.4 FABRICATION
- 2.5 FABRICATION TOLERANCES
- 2.6 FINISHES - STEEL
- 2.7 FINISHES - ALUMINUM

**PART 3 EXECUTION**

- 3.1 EXAMINATION
- 3.2 PREPARATION
- 3.3 INSTALLATION
- 3.4 ERECTION TOLERANCES



## **PART 1 GENERAL**

### **1.1 SECTION INCLUDES**

- .1 Shop fabricated miscellaneous metal items, including:
  - .1 Miscellaneous brackets, supports and angles.
  - .2 Door frame/screen bracing.
  - .3 Sheet metal backing in wall for all wall mounted fixtures, including TV mounts.
  - .4 Stainless steel posts and plate for Team Station desks.
  - .5 Steel support for Quiet Room suspended feature wall and translucent resin panels in Patient Rooms.
  - .6 Aluminum end wall enclosure at exterior windows.

### **1.2 RELATED SECTIONS**

- .1 Section 06 10 00 – Wood Blocking
- .2 Section 06 41 11 – Architectural Cabinetwork: Wall Mounted fixtures and cabinets, suspended bulkheads.
- .3 Section 09 21 16 – Gypsum Board Assemblies: Suspended ceilings and bulkheads
- .4 Section 09 91 10 - Painting: Paint finish.
- .5 Section 08 12 13 – Standard Hollow Metal Frames: Bracing for door frames
- .6 Section 10 11 00 – Visual Display Surfaces
- .7 Section 12 12 30 – Art Hanging and Display Systems
- .8 Section 12 12 30 – Window Roller Shades

### **1.3 REFERENCES**

- .1 ASTM A53/A53M-12 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
- .2 ASTM A153/A153M-09 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- .3 ASTM A307-12 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
- .4 ASTM A500/A500M-10a - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
- .5 ASTM A501-07 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
- .6 ASTM B177/B177M-11 - Standard Guide for Engineering Chromium Electroplating.
- .7 ASTM B209-10 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- .8 ASTM B209M-10 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- .9 ASTM B210-12 - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes.

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- .10 ASTM B210-12 - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes.
  - .11 ASTM B211M-12e1 - Standard Specification for Aluminum and Aluminum-Alloy Bar, Rod, and Wire.
  - .12 ASTM B211-12e1 - Standard Specification for Aluminum and Aluminum-Alloy Bar, Rod, and Wire.
  - .13 ASTM B221-12a - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
  - .14 ASTM B221M-12a - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
  - .15 CAN/CGSB 1.40-97 - Anticorrosive Structural Steel Alkyd Primer.
  - .16 CAN/CGSB 1.181-99 - Ready-Mixed Organic Zinc-Rich Coating.
  - .17 CSA-G40.20-04/G40.21-04 (R2009) - General Requirements for Rolled or Welded Structural Quality Steel/ Structural Quality Steel.
  - .18 CSA-W47.1-09 - Certification of Companies for Fusion Welding of Steel.
  - .19 CSA-W47.2-11 - Certification of Companies for Fusion Welding of Aluminum.
  - .20 CSA-W48-06 (R2011) - Filler Metals and Allied Materials for Metal Arc Welding.
  - .21 CSA-W55.3-08 - Certification of Companies for Resistance Welding of Steel and Aluminum.
  - .22 CSA-W59-03 (R2008) - Welded Steel Construction (Metal Arc Welding).
  - .23 CSA-W59.2-M1991 (R2008) - Welded Aluminum Construction.
  - .24 SSPC (The Society for Protective Coatings) - Steel Structures Painting Manual.

#### 1.4 SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submission procedures.
- .2 Shop Drawings:
  - .1 Provide shop drawings for:
    - .1 Supports for gypsum bulkheads.
    - .2 Supports for plastic laminate bulkheads.
    - .3 Supports for suspended feature wall in Quiet Room and translucent resin panels in Patient Rooms.
    - .4 Door frame and screen bracing.
    - .5 Stainless steel post and plates for support of Team Station desks.
  - .2 Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
  - .3 Indicate welded connections using standard welding symbols. Indicate net weld lengths.
  - .4 To bear stamp of a professional engineer practicing in the place of work.

#### 1.5 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.

## 1.6 CLOSEOUT SUBMITTALS

- .1 Section 01 77 00: Submission procedures.

## 1.7 QUALITY ASSURANCE

- .1 Subcontractor Qualifications: Provide metal fabrications specified in this Section only by a fabricator who has adequate plant, equipment and skilled tradesmen to fabricate and install metal fabrications expeditiously, and is known to have been responsible for satisfactory installations similar to that specified during a period of at least the immediate past five years.
- .2 Welders' Certificates: Submit to Section 01 33 00 requirements, certifying welders employed on the Work, verifying qualification within the previous twelve (12) months to CSA-W55.3, CSA-W47.1 for steel, and CSA-W47.2 for aluminum.
- .3 Prepare Shop Drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the place where the Project is located.
- .4 Requirements of Regulatory Agencies:
  - .1 Metal fabrications which function to resist forces imposed by dead and live loads shall conform to requirements of jurisdictional authorities.
- .5 Submit shop drawings to authorities if required.

## PART 2 PRODUCTS

### 2.1 MATERIALS - STEEL

- .1 Steel Sections and Plates: CAN/350W, Class H.
- .2 Steel Pipe: ASTM A53/A53M, Grade B Schedule 40, extra strong, galvanized finish.
- .3 Steel Tubing: ASTM A500/A500M, Grade B, galvanized finish.
- .4 Stainless Steel: ASTM A268-85, Type 302, Commercial Grade, Seamless Welded to A1S1 No. 4 Finish, exposed surface to have No. 4 polished finish
- .5 Fasteners: Steel, cadmium plated screws and bolts.
- .6 Bolts, Nuts, and Washers: galvanized to ASTM A153/A153M for galvanized components.
- .7 Welding Materials: Type required for materials being welded.
- .8 Shop and Touch-Up Primer: CAN/CGSB-1.40.
- .9 Primer: As specified in Section 09 91 10.

### 2.2 MATERIALS - ALUMINUM

- .1 Extruded Aluminum: ASTM B221, alloy 6063, Temper T5.
- .2 Sheet aluminum: ASTM B209/B209M, Alloy 6061, Temper T5
- .3 Aluminum-Alloy Drawn Seamless Tubes: <ASTM B210M><<ASTM B210>>, Alloy 6063, Temper T6.
- .4 Aluminum-Alloy Bars: ASTM B211M/B211, Alloy 6063, Temper T6.
- .5 Bolts, Nuts, and Washers: Steel, galvanized to ASTM A153/A153M.
- .6 Welding Materials: Type required for materials being welded.

## 2.3 DOOR FRAMING AND SCREEN BRACING

- .1 Supply and install for door frames and view windows greater than 915 mm (3'-0") wide, occurring in metal stud positions, 75 x 38 x 3.18 mm (3" x 1 1/2" x 10 ga) steel channel jamb bracing to the clip-angle fastened to the underside of the floor or structural deck above and slip-out bolt connected to extensions provided by the frame supplier. Refer to drawing in Appendix "A" of this Section.
- .2 Fasten jamb bracing to 75 x 75 x 5 mm (3" x 3" x 1/4") clip angles rigidly connected to structure.
- .3 Where the total length of the jamb bracing exceeds 915 mm (3'-0") above the frame head, each shall be additionally braced diagonally with 75 x 75 x 5 mm (3" x 3" x 1/4") angles connected to the structure in a manner similar to that described in the foregoing paragraphs (1) and (2), using 75 x 75 x 5 mm (3" x 3" x 1/4") steel angle, as described on Door Schedule.
- .4 Provide cut-outs as required by hollow metal frame supplier for the anchorage of frames.

## 2.4 FABRICATION

- .1 Fit and shop assemble items in largest practical sections, for delivery to site.
- .2 Fabricate items with joints tightly fitted and secured.
- .3 Continuously seal joined members by continuous welds.
- .4 Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- .5 Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- .6 Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

## 2.5 FABRICATION TOLERANCES

- .1 Squareness: 1/8 inch (3 mm) maximum difference in diagonal measurements.
- .2 Maximum Offset Between Faces: 1/16 inch (1.6 mm).
- .3 Maximum Misalignment of Adjacent Members: 1/16 inch (1.6 mm).
- .4 Maximum Bow: 1/8 inch (3 mm).
- .5 Maximum Deviation From Plane: 1/16 inch (1.6 mm).

## 2.6 FINISHES - STEEL

- .1 Prepare surfaces to be primed in accordance with SPCC SP 2.
- .2 Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- .3 Do not prime surfaces in direct contact with concrete or where field welding is required.
- .4 Prime paint items with one (1) coat.
- .5 Structural Steel Members: Galvanize after fabrication to appropriate grade for type and size of steel material indicated.
- .6 Non-structural Items: Galvanized after fabrication to appropriate grade for type and size of steel material indicated.
- .7 Chrome Plating: ASTM B177, nickel-chromium alloy, satin finish.

---

## 2.7 FINISHES - ALUMINUM

- .1 Finish coatings to conform to AAMA 2605.
- .2 Interior Aluminum Surfaces: AAMA31 anodized, prepared with a mechanical M 10, pre-treatment, anodized to clear colour.
- .3 Apply one (1) coat of bituminous paint to concealed aluminum surfaces in contact with cementitious or dissimilar materials.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- .1 Section 01 77 00: Verify existing conditions before starting work.
- .2 Verify that field conditions are acceptable and are ready to receive work.
- .3 Verify dimensions, tolerances, and method of attachment with other work.

### 3.2 PREPARATION

- .1 Clean and strip aluminum and primed steel items to bare metal where site welding is required.

### 3.3 INSTALLATION

- .1 Install items plumb and level, accurately fitted, free from distortion or defects.
- .2 Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- .3 Field weld components indicated on Shop Drawings.
- .4 Perform field welding to CSA requirements.
- .5 Obtain approval prior to site cutting or making adjustments not scheduled.
- .6 After erection, prime welds, abrasions, and surfaces not [shop primed] [galvanized], except surfaces to be in contact with concrete.

### 3.4 ERECTION TOLERANCES

- .1 Maximum Variation From Plumb: 1/4 inch (6 mm) per story, non-cumulative.
- .2 Maximum Offset From True Alignment: 1/4 inch (6 mm).
- .3 Maximum Out-of-Position: 1/4 inch (6 mm).

END OF SECTION

**PART 1 GENERAL**

- 1.1 SECTION INCLUDES
- 1.2 RELATED SECTIONS
- 1.3 REFERENCES
- 1.4 SUBMITTALS FOR REVIEW
- 1.5 SUBMITTALS FOR INFORMATION
- 1.6 CLOSEOUT SUBMITTALS
- 1.7 QUALITY ASSURANCE

**PART 2 PRODUCTS**

- 2.1 MATERIALS
- 2.2 ACCESSORIES
- 2.3 FACTORY WOOD TREATMENT

**PART 3 EXECUTION**

- 3.1 FRAMING
- 3.2 SHEATHING
- 3.3 SITE APPLIED WOOD TREATMENT

## **PART 1 GENERAL**

### **1.1 SECTION INCLUDES**

- .1 Wood furring.
- .2 Concealed wood blocking.
- .3 Preservative treatment of wood.

### **1.2 RELATED SECTIONS**

- .1 Section 06 41 11 – Architectural Cabinet Work.
- .2 Section 08 12 13 – Standard Hollow Metal Frames: Door openings to receive wood blocking.

### **1.3 REFERENCES**

- .1 CAN/CSA-O80.20 – Lumber - Wood Preservation
- .2 CAN/CSA -O80.27 – Plywood – Wood Preservation.
- .3 CSA-O121-08 - Douglas Fir Plywood.
- .4 CSA-O141-05 (R2009) - Softwood Lumber.
- .5 CSA-O151-09 - Canadian Softwood Plywood.
- .6 CSA-O153-M1980 (R2008) - Poplar Plywood.
- .7 CSA-O437 Series 93 (R2011) - Standards on OSB and Waferboard.
- .8 NPA A208.1-2009 - Particleboard.
- .9 APA (American Plywood Association) - Grades and Specifications.
- .10 CANPLY (Canadian Plywood Association) - Canadian Plywood Handbook.
- .11 NLGA (National Lumber Grades Authority) - Standard Grading Rules for Canadian Lumber, 2010 edition.

### **1.4 SUBMITTALS FOR REVIEW**

- .1 Section 01 00 00: Submission procedures.
- .2 Product Data: Provide technical data on wood preservative materials.

### **1.5 SUBMITTALS FOR INFORMATION**

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Provide application instructions.

### **1.6 CLOSEOUT SUBMITTALS**

- .1 Section 01 77 00: Submission procedures.

### **1.7 QUALITY ASSURANCE**

- .1 Lumber Products: Graded and stamped to NLGA requirements.
- .2 Plywood Products: Certified and graded to CANPLY requirements.

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## PART 2 PRODUCTS

### 2.1 MATERIALS

- .1 Lumber: NLGA (Standard Grading Rules for Canadian Lumber).
  - .1 CAN/CSA-O141, softwood Spruce or Ontario White Pine species, Construction grade or Stud grade.
  - .2 19% maximum moisture content (S-dry),
  - .3 Pressure preservative treated if required to CAN/CSA-O80 Series.
- .2 Plywood: CSA-O121 (DFP), Grade G1S; sanded.
- .3 Fire-Retardant-Treat Plywood: CSA-O080.27, 19mm (3/4") thick, square edges.

### 2.2 ACCESSORIES

- .1 Fasteners: Hot dipped galvanized steel for high humidity and treated wood locations, unfinished steel elsewhere.
- .2 Anchors: Toggle bolt type for anchorage to hollow masonry, expansion shield and lag bolt type for anchorage to solid masonry or concrete, and bolt or ballistic fastener for anchorages to steel.

### 2.3 FACTORY WOOD TREATMENT

- .1 Wood Preservative (Pressure Treatment): CAN/CSA-O80 Series using water borne preservative with 0.25% retainage.
- .2 Wood Preservative (Surface Application): Green coloured , copper naphthenate or 5% Pentachlorophenol solution.

## PART 3 EXECUTION

### 3.1 FRAMING

- .1 Set members level and plumb, in correct position.
- .2 Place horizontal members, crown side up.
- .3 Space furring at 400 mm (16 inches) on centre.

### 3.2 SHEATHING

- .1 Secure sheathing to framing members with ends over firm bearing and staggered.
- .2 Install telephone and electrical panel back boards with fire-retardant-treated plywood sheathing material where required. Install panel with stamp facing outward. Do not apply opaque coating over stamp.

### 3.3 SITE APPLIED WOOD TREATMENT

- .1 Apply preservative treatment in accordance with manufacturer's written instructions.
- .2 Allow preservative to dry prior to erecting members.

**END OF SECTION**



**PART 1 GENERAL**

- 1.1 SECTION INCLUDES
- 1.2 RELATED SECTIONS
- 1.3 REFERENCES
- 1.4 ADMINISTRATIVE REQUIREMENTS
- 1.5 SUBMITTALS FOR REVIEW
- 1.6 SUBMITTALS FOR INFORMATION
- 1.7 CLOSEOUT SUBMITTALS
- 1.8 QUALITY ASSURANCE
- 1.9 DELIVERY, STORAGE, AND PROTECTION
- 1.10 ENVIRONMENTAL REQUIREMENTS
- 1.11 MILLWORK GUARANTEE
- 1.12 TRANSLUCENT RESIN PANEL WARRANTY

**PART 2 PRODUCTS**

- 2.1 LUMBER MATERIALS
- 2.2 SHEET MATERIALS
- 2.3 FLAT GLASS MATERIAL
- 2.4 WORKSTATION ACCESSORIES
- 2.5 TRANSLUCENT RESIN PANEL
- 2.6 ACCESSORIES
- 2.7 HARDWARE
- 2.8 SHOP TREATMENT OF WOOD MATERIALS
- 2.9 PLASTIC LAMINATE CASEWORK
- 2.10 PLASTIC LAMINATE COUNTERTOPS
- 2.11 FABRICATION
- 2.12 FACTORY FINISHING

**PART 3 EXECUTION**

- 3.1 EXAMINATION
- 3.2 INSTALLATION
- 3.3 ADJUSTING
- 3.4 CLEANING

## **PART 1 GENERAL**

### **1.1 SECTION INCLUDES**

- .1 Custom shop fabricated cabinet units.
- .2 Countertops.
- .3 Wall panels and bulkheads.
- .4 All cabinet hardware.
- .5 Glass for cabinet shelves and cabinet doors, c/w hardware and accessories.
- .6 Workstation accessories.
- .7 Translucent resin panel and accessories

### **1.2 RELATED SECTIONS**

- .1 Section 06 10 13 - Wood Blocking and Curbing: Grounds and support framing.
- .2 Section 08 14 16 - Flush Wood Doors.
- .3 Section 08 71 00 – Finishing Hardware.
- .4 Section 08 80 50 - Glass and Glazing: Glass for casework.
- .5 Division 26 – Electrical: Power, signal, and data wiring.

### **1.3 REFERENCES**

- .1 BHMA A156.9-2010 - Cabinet Hardware.
- .2 CAN/CGSB 11.3-M87 - Hardboard.
- .3 CAN/CSA O80 Series 08 - Wood Preservation.
- .4 CAN/CSA-0160-16 – Formaldehyde Emissions Standard for Composite Wood Products.
- .5 CAN/ULC S102 – Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies.
- .6 NPA A208.2-2009 - Medium Density Fibreboard (MDF) for Interior Applications.
- .7 IAPMO Z124.3-2005 - Plastic Lavatories.
- .8 IAPMO Z124.6-2007 - Plastic Sinks.
- .9 AWMAC - Architectural Woodwork Standards (AWS) – 2nd Edition, 2014.
- .10 NEMA LD3-2005 - High Pressure Decorative Laminates (HPDL).

### **1.4 ADMINISTRATIVE REQUIREMENTS**

- .1 Section 01 31 13: Project management and coordination procedures.

### **1.5 SUBMITTALS FOR REVIEW**

- .1 Section 01 33 00: Submission procedures.
- .2 Qualification: AWMAC Certificate or letter from AWMAC indicating that the Manufacturer is a member of AWMAC and is in good standing.

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- .3 Shop Drawings: Indicate materials, component profiles and elevations, assembly methods, joint details, fastening methods, accessory listings, hardware location and schedule of finishes.
  - .4 Product Data: Provide product data for translucent resin panel and top mounted shoe, cabinet hardware and workstation accessories.
  - .5 Samples:
    - .1 Submit two (2), 4x5 inch size samples, illustrating the colour, pattern, texture and finish of each plastic laminate specified.
    - .2 Submit two (2), 6x6 inch size samples, illustrating the colour, pattern, texture and finish of each translucent resin panel specified, along with specified hardware.
    - .3 Submit two (2) 4 inch samples, illustrating the colour, pattern, texture and finish of each plastic laminate specified.
    - .4 Submit two (2) 6x6" samples of each glass specified.
    - .5 Submit two (2) 6" long samples of top mounted shoe for translucent resin panel.

#### 1.6 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.
- .2 AWMAC Quality Certification Program: Submit a copy of the registration including registration number.
- .3 Installation Data: Provide application instructions.

#### 1.7 CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.

#### 1.8 QUALITY ASSURANCE

- .1 Perform work to AWMAC Custom quality.
- .2 Cabinetwork Fabricator Qualifications: Company in good standing with AWMAC and specializing in fabricating Products specified in this section with minimum five (5) years experience.
- .3 Cabinetwork Installer Qualifications: Company specializing in performing the work of this section with minimum five (5) years documented experience.
- .4 Solid Surfacing Fabricator and Installer Qualifications: Fabricator/Installer certified by manufacturer.
- .5 Certification: Upon award of contract, register Work under this Section with the AWMAC Quality Certification Program, and provide at the end of the project certificates indicating that products and installation comply with the grades specified.

#### 1.9 DELIVERY, STORAGE, AND PROTECTION

- .1 Section 01 60 00: Transport, handle, store, and protect products.
- .2 Protect units from moisture damage as specified in AWMAC.

#### 1.10 ENVIRONMENTAL REQUIREMENTS

- .1 Section 01 60 00: Environmental conditions affecting products on site.
- .2 During and after installation of work of this section, maintain the same temperature and humidity conditions in building spaces as will occur after occupancy.

### 1.11 MILLWORK GUARANTEE

- .1 The Guarantee shall cover making good any defects in Millwork due to faulty workmanship or defective material supplied by the Millwork Sub-Contractor which appears during a two (2) year period following Substantial Completion of the building contract.
- .2 Millwork Sub-Contractors using a security bond type guarantee shall supply a letter of the bond to be used, together with written proof of his ability to furnish same along with his tender at no additional cost to the Owner
- .3 Submit three (3) copies of signed and written guarantee for incorporation in the Project Record Document Manuals in accordance with Section 01 77 00, Contract Closeout and Submittals.

### 1.12 TRANSLUCENT RESIN PANEL WARRANTY

- .1 Manufacturer's Special Warranty on Plastic Fabrications: Manufacturer's standard form agreeing to repair or replace units that fail in material or workmanship within the specified warranty period.
- .2 Warranty Period: 2 year after the date of substantial completion.
- .3 The warranty shall not deprive the owner of other rights or remedies the Owner may have under other provisions of the Contract Documents, and is in addition to and runs concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

## PART 2 PRODUCTS

### 2.1 LUMBER MATERIALS

- .1 Lumber: To the requirements of AWMAC grades specified.
- .2 Hardwood Lumber: Maple species, plain sawn, maximum moisture content of 6% for interior work, and 12% for exterior work; with vertical grain, of quality suitable for transparent finish.
- .3 Softwood Lumber: Pine species, plain sawn, maximum moisture content of 6% for interior work, and 12% for exterior work; with vertical grain, of quality suitable for transparent finish.

### 2.2 SHEET MATERIALS

- .1 Sheet Materials: To the requirements of AWMAC grades specified.
- .2 Hardwood Plywood: Fibreboard core; Birch face species, rotary cut, of quality suitable for opaque finish; Birch face species, quarter cut, of quality suitable for transparent finish.
- .3 Medium Density Fibreboard (MDF): NPA A208.2; composed of wood fibres, medium density, moisture resistant; of grade to suit application; sanded faces. **Used fire-rated MDF located within corridors.**
- .4 Hardboard: CAN/CGSB 11.3; pressed wood fibre with resin binder, tempered grade, 6 mm (1/4 inch) thick, smooth one (1) side.
- .5 High Pressure Laminate: NEMA LD3, high pressure laminate, Grade HGS,
  - .1 PL1: Wilsonart Solicor – Linen D427-60, Matte finish. Fire-rated laminate.
  - .2 PL2: Pionite Woodgrains – Cinnamon Noce WW601, Suede finish. Fire-rated laminate + ChemGuard)
  - .3 PL3: Wilsonart Woodgrains – Montana Walnut 7110K-78, Fine grain finish with Aeon Scratch Resistance.

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- .4 PL4: Wilsonart Woodgrains - White Cypress 7976K-12, Soft grain finish with Aeon Scratch Resistance.
  - .6 Thermofused Decorative Overlay (Melamine): NEMA LD3, melamine-impregnated decorative paper thermally fused to MDF core; white colour.
  - .7 Laminate Backing Sheet: NEMA LD3, same pattern as face laminate, same thickness and manufacturer as face laminate.
  - .8 Cabinet Liner: NEMA LD3, Grade CLS, not less than 0.5 mm thick, white colour.

## 2.3 MANUFACTURERS - SOLID SURFACING

- .1 Dupont; Product: Corian
- .2 Substitutions: Not permitted.

## 2.4 SOLID SURFACING

- .1 Solid Polymer Surfacing: ANSI Z124.6 or ANSI Z124.3, cast, nonporous, filled polymer, composite or laminated construction, through body colours; stain resistant to domestic chemicals and cleaners.
- .2 Colour: Corian – Antarctica

## 2.5 SEATING FABRIC

- .1 Silicone Fabric: Upholstery made of 100% silicone, PVC free, and complying with Greenguard Gold Certified standards. Manufactured by Momentum Textiles.
- .1 **FB1: Floral Taupe Design with Stripes**
  - .1 Pattern: Silica Effloresce
  - .2 Colour: Dove
  - .3 Content: 100% Silicone
  - .4 Backing: Polyester
  - .5 Repeat: 12-1/4" L, 14-1/8" W
  - .6 Durability: 500,000 D.R.
  - .7 Maintenance: WS; Bleach Cleanable (4:1)
  - .8 Application: Upholstery Seating
  - .9 Width: 54"
  - .10 Flame Resistance: CA Bulletin 117 2013

## 2.6 FLAT GLASS MATERIAL

- .1 Safety Glass (Type GL-2) CAN/CGSB-12.1, clear, tempered; 3/8" thick. All exposed edges to be "flat polish", and siliconed edges to be "flat grind".
- .2 Safety Glass (Type GL-3) CAN/CGSB-12.1 clear, tempered; 1/4" thick. All exposed edges to be "flat polish", and siliconed edges to be "flat grind".

## 2.7 WORKSTATION ACCESSORIES

- .1 Keyboard Tray: Humanscale 6G500-FMP22 or approved alternate.
- .2 Monitor Arm:

- .1 Desk mounted: Humanscale M2 Monitor Arm M21BTBBTB or approved alternate.
- .2 Wall mounted: Humanscale H2 monitor arm M21HMSBTB or approved alternate
- .3 Cable Management Tray: Humanscale NeatLinks, 2.6" diameter NL17SB or approved alternate.

Provide 2 units for each workstation, and 4 units at PAA (K1E 30).

## 2.8 TRANSLUCENT RESIN PANEL (TP1)

- .1 Laminated polyester resin sheet:
  - .1 Product: 3Form Varia Ecoresin
  - .2 Style: Fossil Leaf Spade Random
  - .3 Gauge: 3/8"
  - .4 Surface Finish: Sandstone FDI (both sides)
  - .5 Orientation: Vertical
  - .6 Mounting accessories: Versa clamping bracket (#3-15-1752-K) with wall plate (#3-15-0019)

## 2.9 ACCESSORIES

- .1 Adhesive: as recommended by AWMAC/AWS to suit cabinetwork application, and as recommended by solid surfacing manufacturer to suit solid surfacing application. Plastic laminate adhesive to suit fire rated application.
- .2 Edge Band: Doors, drawers, shelving, gables and other exposed edges of plywood and MDF shall be finished on all exposed edges to match exposed face.
  - .1 Solid hardwood and veneer face: Matching solid T-edge hardwood 10mm (3/8" thick minimum edge band, unless otherwise specified, applied using a hot glue process.
  - .2 High Pressure Decorative Laminate Face: ABS Edge Banding to match HPDL in pattern and colour, including underside of support gables.
- .3 Fasteners: Size and type to suit application.
- .4 Bolts, Nuts, Washers, Lags, Pins, and Screws: Concealed, of size and type to suit application;
- .5 Concealed Joint Fasteners: Threaded steel.
- .6 Grommets: Metal material for cut-outs.
- .7 Air Vent Grille: 6"x14", steel construction, powder-coated paint in white.
- .8 Tape: Aluminum foil, insulating and heat dissipating tape.

## 2.10 HARDWARE

- .1 Shelf Standards and Rests: Formed steel channels and rests, flush mount type, cut for fitted rests spaced at 25 mm (1 inch) centres; satin chrome finish.
- .2 Shelf Brackets: Formed steel brackets, formed for attachment with lugs; satin finish.
- .3 Drawer and Door Pulls: Stainless Steel, satin finish, Mockett DP 158-SSS, 6 5/16" wide, ADA Compliant.
- .4 Glass shelf clamp: CRL Small Square Interior Shelf Clamp, polished chrome finish, or approved alternate
- .5 Folding desk bracket: 4 – position folding bracket, with finger-tip release, steel construction, zinc plated. Lee Valley folding bracket or approved alternate.

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- .6 Sliding Glass Doors for Showcase: By-pass sliding system for frameless glass cabinet doors. Top double track, anodized aluminum, recessed mounted. Include hidden soft-closing mechanism. EKU-CLIPO or approved alternate.
  - .7 Sliding Glass Door Lock: Model 2C brass sliding glass door lock, pin tumble, push and cam, Richelieu #368670195
  - .8 Top Shoe for Translucent Resin Panel: Two-piece aluminum shoe with removable socket head, recess mounted into headwall. Blumcraft SB200 or approved alternate.
  - .9 Cabinet Locks: Keyed cylinder, five (5) keys per lock, master keyed.
  - .10 Catches: Touch type.
  - .11 Drawer Slides: Galvanized steel construction, ball bearings separating tracks, full extension self-closing type.
  - .12 Hinges: Concealed cup/ Euro type, steel with satin finish.
  - .13 Grommet: Metal cable grommet, one-piece, round, 2 ½" diameter, matte nickel finish.
  - .14 Coplanar Sliding Door System: Richelieu – Coplanar Sliding System: EKU-Frontino Forslide system. Anodized aluminum tracks and accessories. Use top running sliding system for upper cabinet, and bottom running sliding system for base cabinet. Soft opening and closing mechanism.

## 2.11 SHOP TREATMENT OF WOOD MATERIALS

- .1 Shop brush apply wood materials requiring preservatives to concealed wood blocking.
- .2 Provide ULC approved identification on fire retardant treated material.
- .3 Deliver fire retardant treated materials cut to required sizes. Minimize field cutting.

## 2.12 PLASTIC LAMINATE CASEWORK

- .1 Cabinet Construction: Flush overlay, adjustable shelving MDF core.
- .2 Exposed Surfaces:
  - .1 Drawers and Drawer Fronts: High pressure laminate both sides.
  - .2 Cabinet doors: High pressure laminate both sides.
  - .3 Shelves: High pressure laminate both sides.
  - .4 Edges: High pressure laminate.
- .3 Semi-exposed Surfaces:
  - .1 Surfaces (other than drawer bodies): High pressure laminate.
  - .2 Interior Shelves behind doors: High pressure laminate both sides
  - .3 Edges: High pressure laminate.
  - .4 Drawer Sides and Backs: Edgebanded, thermofused Melamine.
  - .5 Drawer Bottoms: Edgebanded, thermofused Melamine.

## 2.13 PLASTIC LAMINATE COUNTERTOPS

- .1 Comply with AWMAC Quality Standards, Custom grade requirements for plastic laminate counter construction supplemented as follows:
- .2 High Pressure Laminate: NEMA LD3, high pressure laminate, Grade HGS; colour and finish as specified.

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- .3 Postformed Laminate: NEMA LD3, high pressure laminate, Grade HGP; colour and finish as specified.
  - .4 Edge Treatment: Same as laminate cladding on horizontal surfaces.
  - .5 Core Material: Medium density fiberboard.

## 2.14 FABRICATION

- .1 Shop prepare and identify components for matching during site assembly.
- .2 Shop assemble casework for delivery to site in units easily handled and to permit passage through building openings.
- .3 When necessary to cut and fit on site, provide materials with ample allowance for site cutting and scribing.
- .4 Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Locate counter butt joints minimum 900 mm (3 ft) from sink cut-outs.
- .5 Apply wood laminate by grain matching adjacent sheets to book matching.
- .6 Apply laminate backing sheet to reverse concealed side of plastic laminate finished surfaces.
- .7 Provide cutouts for fixtures and fittings, appliances, outlet boxes, plumbing fixtures and inserts. Verify locations of cutouts from on-site dimensions. Seal cut edges.
- .8 Shop glaze glass materials using interior methods specified in Section 08 80 50.

## 2.15 FACTORY FINISHING

- .1 Sand work smooth and set exposed nails and screws.
- .2 Apply wood filler in exposed indentations.
- .3 On items to receive transparent finishes, use wood filler which matches surrounding surfaces and of types recommended for applied finishes.
- .4 Seal, stain and varnish exposed to view surfaces. Spray apply only.
- .5 Seal, stain and varnish internal exposed to view and semi-concealed surfaces. Brush apply only.
- .6 Seal internal surfaces with two (2) coats of shellac. Brush apply only.
- .7 Seal surfaces in contact with cementitious materials.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- .1 Section 01 10 00: Verify existing conditions before starting work.
- .2 Verify adequacy of backing and support framing.
- .3 Verify location and sizes of utility rough-in associated with work of this section.

### 3.2 INSTALLATION

- .1 Install Work to AWMAC Custom Grade.
- .2 Set and secure casework in place; rigid, plumb, and level.
- .3 Use fixture attachments in concealed locations for wall mounted components.



- .4 Use concealed joint fasteners to align and secure adjoining counter tops and cabinet units.
- .5 Carefully scribe casework abutting other components, with maximum gaps of 1 mm (1/32 inch). Do not use additional overlay trim for this purpose.
- .6 Secure cabinet to floor using appropriate angles and anchorages.
- .7 Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.
- .8 Site glaze glass materials using the Interior method specified in Section 08 80 50.

### **3.3 ADJUSTING**

- .1 Test installed work for rigidity and ability to support loads.
- .2 Adjust moving or operating parts to function smoothly and correctly.

### **3.4 CLEANING**

- .1 Section 01 74 13: Cleaning installed work.
- .2 Clean casework, counters, shelves, hardware, fittings, and fixtures.

**END OF SECTION**

**PART 1 GENERAL**

- 1.1 SECTION INCLUDES
- 1.2 RELATED SECTIONS
- 1.3 REFERENCES
- 1.4 PERFORMANCE REQUIREMENTS
- 1.5 ADMINISTRATIVE REQUIREMENTS
- 1.6 SUBMITTALS FOR REVIEW
- 1.7 SUBMITTALS FOR INFORMATION
- 1.8 CLOSEOUT SUBMITTALS
- 1.9 QUALITY ASSURANCE
- 1.10 REGULATORY REQUIREMENTS
- 1.11 ENVIRONMENTAL REQUIREMENTS
- 1.12 WARRANTY

**PART 2 PRODUCTS**

- 2.1 MANUFACTURERS
- 2.2 MATERIALS

**PART 3 EXECUTION**

- 3.1 EXAMINATION
- 3.2 PREPARATION
- 3.3 PROTECTION
- 3.4 APPLICATION
- 3.5 FIELD QUALITY CONTROL
- 3.6 CLEANING

## **PART 1 GENERAL**

### **1.1 SECTION INCLUDES**

- .1 Cementitious fireproofing, spray applied.

### **1.2 RELATED SECTIONS**

- .1 Section 07 84 00 - Firestopping.
- .2 Section 09 21 16 - Gypsum Board Assemblies: Gypsum board fireproofing.

### **1.3 REFERENCES**

- .1 ASTM E72-10 - Standard Test Methods of Conducting Strength Tests of Panels for Building Construction.
- .2 ASTM E84-12c - Standard Test Method for Surface Burning Characteristics of Building Materials.
- .3 ASTM E119-12a - Standard Test Methods for Fire Tests of Building Construction and Materials.
- .4 CAN/ULC-S101-07 - Standard Methods of Fire Endurance Tests of Building Construction and Materials.
- .5 CAN/ULC-S102-10 - Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
- .6 UL - Fire Resistance Directory.
- .7 ULC - Building Materials Directory.

### **1.4 PERFORMANCE REQUIREMENTS**

- .1 Cementitious Fireproofing System: Provide fire rated assembly rating to match existing assembly.

### **1.5 ADMINISTRATIVE REQUIREMENTS**

- .1 Section 01 00 00: Project management and coordination procedures.
- .2 Pre-installation Meetings: Convene one (1) week before starting work of this section.
- .3 Sequencing: Sequence work in conjunction with placement of ceiling hanger tabs, mechanical component hangers, and electrical components.

### **1.6 SUBMITTALS FOR REVIEW**

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide data indicating product characteristics, and performance and limitation criteria.

### **1.7 SUBMITTALS FOR INFORMATION**

- .1 Section 01 33 00: Submission procedures.
- .2 Test Reports: Indicating the following:

- 
- .1 Bond Strength of Fireproofing: ASTM E72, tested to provide minimum bond strength twenty times weight of fireproofing materials.
  - .2 Fire test reports of fireproofing application to substrate materials similar to project conditions.
  - .3 Reports from reputable independent testing agencies, of product proposed for use, which indicate conformance to the following:
    - .1 Fire Endurance: CAN/ULC-S101.
    - .2 Surface Burning Characteristics: CAN/ULC-S102.
  - .3 Installation Data: Manufacturer's special installation requirements, including special procedures, and perimeter conditions requiring special attention.
  - .4 Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.
  - .5 Manufacturer's Field Reports: Indicate environmental conditions under which fireproofing materials were installed.

## 1.8 CLOSEOUT SUBMITTALS

- .1 Section 01 77 00: Submission procedures.

## 1.9 QUALITY ASSURANCE

- .1 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five (5) years experience.
- .2 Applicator Qualifications: Company specializing in performing the work of this section with minimum five (5) years documented experience and approved by the manufacturer.

## 1.10 REGULATORY REQUIREMENTS

- .1 Conform to applicable code for fire resistance ratings.

## 1.11 ENVIRONMENTAL REQUIREMENTS

- .1 Follow manufacturer's instruction for storage conditions.
- .2 Do not apply spray fireproofing when temperature of substrate material and surrounding air is below 5 degrees C (40 degrees F).
- .3 Provide ventilation in areas to receive fireproofing during and twenty-four (24) hours after application, to dry material.
- .4 Provide temporary enclosure to prevent spray from contaminating air.

## 1.12 WARRANTY

- .1 Section 01 77 00: Warranties.
- .2 Provide a five (5) year warranty to include coverage for failure to meet specified requirements.
- .3 Warranty: Include coverage for fireproofing to remain free from cracking, checking, dusting, flaking, spalling, separation, and blistering. Reinstall or repair failures.

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## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- .1 A/D Fireprotection; Product: Type 5GP.
- .2 Other acceptable manufacturers offering functionally and aesthetically equivalent products.
  - .1 Grace & Company; Product: MK-6.
  - .2 Isolatek; Product: CAFCO 300.

### 2.2 MATERIALS

- .1 Cementitious Spray Fireproofing: Factory mixed, cementitious material blended for uniform texture; non-fibrous materials; conforming to following requirements:
  - .1 Bond Strength: 2 070 kPa (300 psi) when set and dry.
  - .2 Bond Impact: No cracking, flaking or delamination.
  - .3 Dry Density: Minimum average density of 290 kg/cu m (17 lb/cu ft), with minimum individual density of any test sample of 240 kg/cu m (15 lb/cu ft).
  - .4 Compressive Strength: Minimum 1 12 kPa (16 psi).
  - .5 Surface Burning Characteristics: CAN/ULC-S102, Classification for Flame Spread/Smoke Developed: 0.
- .2 Primer and Sealer: Of type recommended by fireproofing manufacturer.
- .3 Metal Lath: Expanded metal lath; 15 kg/sq m (3.4 lb/sq ft), [galvanized] finish.
- .4 Water: Clean, potable.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- .1 Section 01 10 00: Verify existing conditions before starting work.
- .2 Verify that clips, hangers, supports, sleeves, and other items required to penetrate fireproofing, are in place.
- .3 Verify ducts, piping, equipment, or other items which would interfere with application of fireproofing are not positioned until fireproofing work is complete.
- .4 Verify that voids and cracks in substrate are filled, and projections are removed where fireproofing is exposed to view as a finish material.

### 3.2 PREPARATION

- .1 Clean substrate of dirt, dust, grease, oil, loose material, or other matter which may affect bond of fireproofing.
- .2 Remove incompatible materials which affect bond by scraping, brushing, scrubbing, or sandblasting to achieve minimum SSPC SP 3 surface preparation level.

### 3.3 PROTECTION

- .1 Protect surfaces not scheduled for fireproofing and equipment from damage by overspray, fall-out, and dusting.

- .2 Close off and seal duct work in areas where fireproofing is being applied.

### **3.4 APPLICATION**

- .1 Install metal lath over structural members and as indicated on Drawings.
- .2 Apply coatings to manufacturer's written instructions.
- .3 Apply fireproofing in sufficient thickness to achieve rating with as many passes necessary to cover with monolithic blanket of uniform density and texture.
- .4 Apply sealer as recommended by fireproofing manufacturer.

### **3.5 FIELD QUALITY CONTROL**

- .1 Inspect the installed fireproofing after application and curing for integrity of fire protection, prior to concealment of Work.
- .2 Re-inspect the installed fireproofing for integrity of fire protection, after installation of subsequent Work.

### **3.6 CLEANING**

- .1 Section 01 74 13: Cleaning installed work.
- .2 Remove excess material, overspray, droppings, and debris.
- .3 Remove fireproofing from materials and surfaces not required to be fireproofed.

**END OF SECTION**

**PART 1 GENERAL**

- 1.1 SECTION INCLUDES
- 1.2 RELATED SECTIONS
- 1.3 REFERENCES
- 1.4 DEFINITIONS
- 1.5 SYSTEM DESCRIPTION
- 1.6 PERFORMANCE REQUIREMENTS
- 1.7 ADMINISTRATIVE REQUIREMENTS
- 1.8 SUBMITTALS FOR REVIEW
- 1.9 SUBMITTALS FOR INFORMATION
- 1.10 CLOSEOUT SUBMITTALS
- 1.11 QUALITY ASSURANCE
- 1.12 REGULATORY REQUIREMENTS
- 1.13 DELIVERY, STORAGE, AND PROTECTION
- 1.14 ENVIRONMENTAL REQUIREMENTS

**PART 2 PRODUCTS**

- 2.1 MANUFACTURERS
- 2.2 PRODUCTS
- 2.3 ACCESSORIES
- 2.4 FINISHES

**PART 3 EXECUTION**

- 3.1 EXAMINATION
- 3.2 PREPARATION
- 3.3 APPLICATION
- 3.4 CLEANING
- 3.5 PROTECTION OF FINISHED WORK

## **PART 1 GENERAL**

### **1.1 SECTION INCLUDES**

- .1 Fireproof fire-stopping materials and accessories.

### **1.2 RELATED SECTIONS**

- .1 Section 07 81 16 - Cementitious Fireproofing.
- .2 Section 09 21 16 - Gypsum Board Assemblies: Gypsum wallboard fireproofing.
- .3 Division 23 – Heating, Ventilating, and Air-Conditioning (HVAC): Mechanical work requiring fire-stopping.
- .4 Division 26 – Electrical Section: Electrical work requiring fire-stopping.

### **1.3 REFERENCES**

- .1 ASTM E84-12c - Standard Test Method for Surface Burning Characteristics of Building Materials.
- .2 ASTM E119-12a - Standard Test Methods for Fire Tests of Building Construction and Materials.
- .3 ASTM E814-11a - Standard Test Method for Fire Tests of Penetration Firestop Systems.
- .4 ASTM E1966-07(2011) - Standard Test Method for Fire-Resistive Joint Systems.
- .5 CAN/ULC-S101-07 - Standard Methods of Fire Endurance Tests of Building Construction and Materials.
- .6 CAN/ULC-S102-10 - Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
- .7 CAN/ULC-S115-11 - Standard Method of Fire Tests of Firestop Systems.
- .8 FM (Factory Mutual) - FM 4991-2001, Approval Standard for Approval of Firestop Contractors.
- .9 FCIA (Firestop Contractors International Association) - Manual of Practice.
- .10 NFPA 251 - Standard Methods of Tests of Fire Endurance of Building Construction and Materials, 2006 edition.
- .11 OPL (Omega Point Laboratories).
- .12 UL 263-2011 - Standard for Fire Tests of Building Construction and Materials (14th Edition).
- .13 UL 1479-2003 - Standard for Fire Tests of Through-Penetration Firestops (3rd Edition).
- .14 UL 1709-2011 - Standard for Rapid Rise Fire Tests of Protection Materials for Structural Steel (4th Edition).
- .15 UL 2079-2004 - Standard for Tests for Fire Resistance of Building Joint Systems (4th Edition).
- .16 ULC - Building Materials Directory.
- .17 WHI (Intertek/Warnock Hershey).



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#### 1.4 DEFINITIONS

- .1 Firestopping (Fire-safing): A sealing or stuffing material or assembly placed in spaces between building materials to arrest the movement of smoke, heat, gases, or fire through wall or floor openings.

#### 1.5 SYSTEM DESCRIPTION

- .1 Firestopping systems installed to resist spread of fire and passage of smoke and other gases at penetrations through fire resistance rated wall, roof and floor assemblies, materials and components.

#### 1.6 PERFORMANCE REQUIREMENTS

- .1 Materials, accessories and application procedures listed by ULC, or tested to CAN/ULC-S115 to comply with building code requirements.
- .2 Firestopping Materials: CAN/ULC-S101, ASTM E814, and ASTM E119 to achieve a fire rating as noted on Drawings.
- .3 Surface Burning Characteristics: CAN/ULC-S102.

#### 1.7 ADMINISTRATIVE REQUIREMENTS

- .1 Section 01 31 00: Project management and coordination procedures.
- .2 Coordination: Coordinate with other work having a direct bearing on work of this section.
- .3 Pre-installation Meetings: Convene one (1) week before starting work of this section.

#### 1.8 SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide data on product characteristics, performance and limitation criteria.
- .3 System Design Listings: Submit system design listings, including illustrations from a qualified testing and inspection agency that is applicable for each firestop configuration.

#### 1.9 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special preparation and installation requirements.
- .3 Manufacturer's Certificate: Certify that Products meet or exceed [specified requirements].

#### 1.10 CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.

#### 1.11 QUALITY ASSURANCE

- .1 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five (5) years experience.
- .2 Contractor Qualifications: Company specializing in performing the work of this section and as follows:
  - .1 FM approved in accordance with FM standard 4991 - Approval of Firestop Contractors.
  - .2 Licensed by the province or local authority where applicable.
  - .3 Successfully completed not less than five (5) comparable scale projects.

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- .3 Single Source Responsibility: Obtain firestop systems for each type of penetration and construction situation from a single primary firestop systems manufacturer.

## 1.12 REGULATORY REQUIREMENTS

- .1 Conform to applicable code for fire resistance ratings and surface burning characteristics.

## 1.13 DELIVERY, STORAGE, AND PROTECTION

- .1 Section 01 60 00: Transport, handle, store, and protect products.
- .2 Deliver firestopping products in original, unopened containers with labels intact and legible, identifying product and manufacturer.
- .3 Store and handle firestopping materials to manufacturer's instructions.

## 1.14 ENVIRONMENTAL REQUIREMENTS

- .1 Section 01 60 00: Environmental conditions affecting products on site.
- .2 Do not apply materials when temperature of substrate material and ambient air is below <15 degrees C (60 degrees F).
- .3 Maintain this minimum temperature before, during, and for three (3) days after installation of materials.
- .4 Provide ventilation to manufacturer's instructions in areas to receive solvent cured materials.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- .1 Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Project include, but are not limited to the following; Other acceptable manufacturers offering functionally [and aesthetically] equivalent products.
  - .1 A/D Fire Protection;
  - .2 Tremco;
  - .3 Nuco Inc;
- .2 Substitutions: Not permitted.

### 2.2 PRODUCTS

- .1 Provide penetration firestopping that is produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.
- .2 Penetrations in Fire-Resistance-Rated Walls: Provide penetration firestopping with ratings determined per CAN/ULC S115, ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01 in. of water (2.5 Pa). 1. Fire-resistance-rated walls include firewalls, fire barrier walls, smoke-barrier walls and fire partitions. 2. F-Rating: Not less than the fire-resistance rating of constructions penetrated.
- .3 Penetrations in Horizontal Assemblies: Provide penetration firestopping with ratings determined per CAN/ULC S115, ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01 in. of water (2.5 Pa).

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- .1 Horizontal assemblies include floors, floor/ceiling assemblies and ceiling membranes of roof/ceiling assemblies.
  - .2 F-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated.
  - .3 T-Rating: At least 1 hour, but not less than the fire-resistance of construction penetrated except for floor penetrations within the cavity of a wall.
  - .4 Firestopping and Smoke Sealing Systems: Low VOC, asbestos free, capable of maintaining an effective barrier against flame, smoke, gases, temperature rise and hose stream (where noted) in accordance with CAN/ULC S115, ASTM E814 or UL 1479 and not exceeding opening sizes or design limitations for which they are intended.
  - .5 Fire resistance rating of installed firestopping assembly shall not be less than the fire resistance rating of penetrated assembly and to be Type L, F, FT, W, FH or FTH in accordance with the National Building Code of Canada, local Building Codes and applicable Standard requirements.
  - .6 Sealants:
    - .1 Vertical and overhead joints: non-sagging type
    - .2 Horizontal joints and fluid seals at floors: self-leveling type including sprays
    - .3 Flexible: elastomeric type allowing movement and capable of returning to original configuration with damage to seal and without adhesive or cohesive failure.
  - .7 Exposed Penetration Firestopping: Provide products with flame-spread and smokedeveloped indexes of less than 25 and 50, respectively, as determined per CAN/ULC S 102.
  - .8 VOC Content: Provide penetration firestopping that complies with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
  - .9 Architectural Sealants: 250 g/L.
  - .10 Sealant Primers for Nonporous Substrates: 250 g/L
  - .11 Sealant Primers for Porous Substrates: 775 g/L

## 2.3 ACCESSORIES

- .1 Provide components for each penetration firestopping system that needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping manufacturer and approved by qualified testing and inspection agency for firestopping indicated.
  - .1 Permanent forming/damming/backing material include the following:
    - .1 Slag/rock-wool or mineral wool fiber insulation
    - .2 Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
    - .3 Fire-rated form board.
    - .4 Fillers for sealants
  - .2 Temporary forming materials
  - .3 Substrate primers
  - .4 Collars.
  - .5 Steel sleeves.
  - .6 Fire stopping identification labels for penetrations
  - .7 Fire separation (barrier) markings for vertical fire separations.

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## 2.4 FINISHES

- .1 Colour: Black.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- .1 Section 01 10 00: Verify existing conditions before starting work.
- .2 Verify opening configurations, penetrating items, substrates, and other conditions affecting performance of firestopping are ready to receive the work of this section.
- .3 Do not proceed with installation until unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- .1 Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter which may affect bond of firestopping material.
- .2 Remove incompatible materials which may affect bond.
- .3 Install damming, backing materials to arrest liquid material leakage.

### 3.3 APPLICATION

- .1 Apply primer and firestopping materials to manufacturer's written instructions.
- .2 Install material at walls or partition openings which contain penetrating sleeves, piping, ductwork, conduit and other items, requiring firestopping.
- .3 Apply firestopping material in sufficient thickness to achieve rating to uniform density and texture.
- .4 Compress fibred material to achieve a density of 40% of its uncompressed density.
- .5 Place foamed material in layers to ensure homogenous density, filling cavities and spaces. Place sealant to completely seal junctions with adjacent dissimilar materials.
- .6 Place intumescent coating in sufficient coats to achieve rating required.
- .7 Dam Material: Remove dam material, if required after firestopping material has cured.

### 3.4 CLEANING

- .1 Section 01 74 13: Cleaning installed work.
- .2 Clean adjacent surfaces of firestopping materials.

### 3.5 PROTECTION OF FINISHED WORK

- .1 Section 01 10 00: Protecting installed work.
- .2 Protect adjacent surfaces from damage by material installation.

END OF SECTION

**PART 1 GENERAL**

- 1.1 SECTION INCLUDES
- 1.2 RELATED SECTIONS
- 1.3 REFERENCES
- 1.4 PERFORMANCE REQUIREMENTS
- 1.5 ADMINISTRATIVE REQUIREMENTS
- 1.6 SUBMITTALS FOR REVIEW
- 1.7 SUBMITTALS FOR INFORMATION
- 1.8 CLOSEOUT SUBMITTALS
- 1.9 QUALITY ASSURANCE
- 1.10 ENVIRONMENTAL REQUIREMENTS
- 1.11 WARRANTY

**PART 2 PRODUCTS**

- 2.1 SEALANTS
- 2.2 ACCESSORIES

**PART 3 EXECUTION**

- 3.1 EXAMINATION
- 3.2 PREPARATION
- 3.3 INSTALLATION
- 3.4 STRUCTURAL SEALANT INSTALLATION
- 3.5 CLEANING
- 3.6 PROTECTION OF FINISHED WORK

## **PART 1 GENERAL**

### **1.1 SECTION INCLUDES**

- .1 Preparing substrate surfaces.
- .2 Sealant and joint backing.

### **1.2 RELATED SECTIONS**

- .1 Section 07 84 00 - Firestopping: Sealants required in conjunction with firestopping.
- .2 Section 08 11 13 - Metal Doors and Frames: Sealants required in conjunction with door frames.
- .3 Section 08 80 50 – Glass and Glazing: Sealants required in conjunction with glazing methods.

### **1.3 REFERENCES**

- .1 ASTM C834-10 - Standard Specification for Latex Sealants.
- .2 ASTM C919-11 - Standard Practice for Use of Sealants in Acoustical Applications.
- .3 ASTM C920-13 - Standard Specification for Elastomeric Joint Sealants.
- .4 ASTM C1184-13 - Standard Specification for Structural Silicone Sealants.
- .5 ASTM C1193-13 - Standard Guide for Use of Joint Sealants.
- .6 ASTM C1311-10 - Standard Specification for Solvent Release Sealants.
- .7 ASTM C1330-02(2007) - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.
- .8 ASTM C1401-09a - Standard Guide for Structural Sealant Glazing.

### **1.4 PERFORMANCE REQUIREMENTS**

- .1 Sealant Design: Design structural sealant to withstand specified loads without breakage, loss, failure of seals, product deterioration, and other defects.
- .2 Design installed sealant to withstand:
  - .1 Movement from ambient temperature range of <49 degrees C (120 degrees F).
  - .2 Movement and deflection of structural support framing.
  - .3 Water and air penetration.

### **1.5 ADMINISTRATIVE REQUIREMENTS**

- .1 Section 01 31 13: Project management and coordination procedures.
- .2 Coordination:
  - .1 Coordinate with other work having a direct bearing on work of this section.
  - .2 Coordinate the work with all sections referencing this section.

### **1.6 SUBMITTALS FOR REVIEW**

- .1 Section 01 33 00: Submission procedures.

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- .2 Product Data: Provide data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, colour availability.

## 1.7 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special installation requirements.
  - .1 Indicate special procedures, surface preparation, perimeter conditions requiring special attention, [field quality control testing].

## 1.8 CLOSEOUT SUBMITTALS

- .1 Section 01 77 00: Submission procedures.

## 1.9 QUALITY ASSURANCE

- .1 Perform work to sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- .2 Perform structural sealant application work to ASTM C1401.
- .3 Perform acoustical sealant application work to ASTM C919.
- .4 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years experience.
- .5 Applicator Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience.

## 1.10 ENVIRONMENTAL REQUIREMENTS

- .1 Section 01 60 00: Environmental conditions affecting products on site.
- .2 Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

## 1.11 WARRANTY

- .1 Section 01 77 00: Warranties.
- .2 Provide a five (5) year warranty to include coverage for failure to meet specified requirements.
- .3 Warranty: Include coverage for installed sealants and accessories which fail to achieve water tight seal and air tight seal and, exhibit loss of adhesion or cohesion, or do not cure.

## PART 2 PRODUCTS

### 2.1 SEALANTS

- .1 Siliconized Acrylic Latex (Type E): ASTM C834; single component, non-sagging, non-staining, non-bleeding, paintable; ASTM C834, Type C, Grade -18°c.
  - .1 Elongation Capability 25%.
  - .2 Service Temperature Range -54 to 82 degrees C (-65 to 180 degrees F).
  - .3 Shore A Hardness Range 15 to 25.
  - .4 Product: Tremflex 834, manufactured by Tremco.

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- .2 Acoustic Sealant (Type G): ASTM C1311, Acoustic grade, single component, solvent release, non-skinning, non-sagging, Grey colour.
    - .1 Elongation Capability 7% to 10%.
    - .2 Service Temperature Range -25 to 82 degrees C (-13 to 180 degrees F)].
    - .3 Shore A Hardness Range [10 to 30].
    - .4 Product: Acoustic Sealant, manufactured by Tremco.
  - .3 Sanitary Silicone Sealant (Type N): ASTM C920, Grade NS, Class 25, Use NT; single component, [acetoxo] curing, non-sagging, non-staining, mildew resistant; colour [as selected].
    - .1 Elongation Capability 25%.
    - .2 Service Temperature Range -54 to 82 degrees C (-65 to 180 degrees F).
    - .3 Shore A Hardness Range 15 to 35.
    - .4 Product: Trensil 200, manufactured by Tremco.

## 2.2 ACCESSORIES

- .1 Primer: Non-staining type, to suit application.
- .2 Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- .3 Joint Backing: ASTM C1330, round, closed cell; polyethylene foam rod, oversized 30% to 50% larger than joint width.
- .4 Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.
- .5 Masking tape: Non-staining, non-absorbent type compatible with sealant and adjacent surfaces.
- .6 Setting Blocks and Spacers: Compatible with silicone sealant and recommended by sealant manufacturer.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- .1 Section 01 10 00: Verify existing conditions before starting work.
- .2 Verify that substrate surfaces and joint openings are clean, dry, and ready to receive work.
- .3 Verify that joint backing and release tapes are compatible with sealant.

### 3.2 PREPARATION

- .1 Remove loose materials and foreign matter which might impair adhesion of sealant.
- .2 Clean and prime joints to sealant manufacturer's written instructions.
- .3 Perform preparation to ASTM C1193 for solvent release and latex base sealants.
- .4 Perform preparation to sealant and manufacturer's written instructions.
- .5 Protect elements surrounding the work of this section from damage or disfiguration.



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### 3.3 INSTALLATION

- .1 Perform installation in accordance with ASTM C1193 for solvent release and latex base sealants and ASTM C919 for acoustical sealants.
- .2 Install sealant to sealant manufacturer's written instructions.
- .3 Measure joint dimensions and size materials to achieve required width/depth ratios, as recommended by sealant manufacturer.
- .4 Install bond breaker where joint backing is not used.
- .5 Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
- .6 Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- .7 Tool joints: concave.

### 3.4 STRUCTURAL SEALANT INSTALLATION

- .1 Site install glass panels specified in Section 08 80 50 to aluminum and stainless steel frames
- .2 Joint Design: Install sealant as follows:
  - .1 Glueline Thickness: 6 mm (1/4 inch) minimum.
  - .2 Structural Bite: 6 mm (1/4 inch) minimum and equal to or greater than glueline thickness.
  - .3 Fill joint with standard sealant application procedures, install backer rod or bond breaker tape to avoid three-sided sealant adhesion.
- .3 Prepare substrates and apply silicone sealant to manufacturer's written instructions and reviewed Shop Drawings.
- .4 Bond glass to metal support members with structural silicone sealant using 2-sided method as detailed on drawings.
- .5 Install sealant without gaps, twisting, stretching, or puncturing backing material. Ensure uniform depth to achieve correct profile, coverage, and performance.
- .6 Use temporary glass supports to retain glass panels while sealant is applied and allowed to cure.
- .7 Provide concave, smooth, uniform, sealant finish. Eliminate air pockets and ensure complete contact on both sides of joint opening.

### 3.5 CLEANING

- .1 Section 01 74 00: Cleaning installed work.
- .2 Clean adjacent soiled surfaces.

### 3.6 PROTECTION OF FINISHED WORK

- .1 Section 01 10 00: Protecting installed work.
- .2 Remove masking tape and excess sealant.
- .3 Protect sealants until cured[, remove temporary glass supports].

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END OF SECTION

PART 1 GENERAL

- 1.1 SECTION INCLUDES
- 1.2 RELATED SECTIONS
- 1.3 REFERENCES
- 1.4 SUBMITTALS FOR REVIEW
- 1.5 SUBMITTALS FOR INFORMATION
- 1.6 CLOSEOUT SUBMITTALS
- 1.7 ADMINISTRATIVE REQUIREMENTS
- 1.8 QUALITY ASSURANCE
- 1.9 SYSTEM DESCRIPTION
- 1.10 DELIVERY, STORAGE AND HANDLING
- 1.11 WARRANTY

PART 2 PRODUCTS

- 2.1 MANUFACTURERS
- 2.2 MATERIALS
- 2.3 FRAME ANCHORS
- 2.4 STEEL FRAMES
- 2.5 STANDARD DUTY STEEL DOORS
- 2.6 HARDWARE REINFORCEMENT AND PREPARATIONS
- 2.7 STEEL FRAME FABRICATION
- 2.8 STEEL DOOR FABRICATION

PART 3 EXECUTION

- 3.1 SITE STORAGE AND PROTECTION
- 3.2 INSTALLATION
- 3.3 WORKMANSHIP
- 3.4 ADJUSTING AND CLEAN-UP

## **PART 1 GENERAL**

### **1.1 SECTION INCLUDES**

- .1 Division 1, General Requirements is a part of this section and shall apply to this section. Conform with requirements of all sections of the General Requirements and any supplements and/or addenda, as it applies to the work of this section.
- .2 Work included: Provide doors and frames including but not limited to following:
  - .1 Steel door frames.
  - .2 Steel transom panels.
  - .3 Steel frames and mullions for borrowed lights and glazed screens.
  - .4 Glazing stops.
  - .5 Steel doors, swing flush type.
  - .6 Preparation of steel doors and frames for security system CSA approved wiring and/or conduit for electronic hardware. Include junction boxes and conduit for electronic hardware. Include system consisting of 15 conductors of 22 gauge wire complete with a modular quick connect wiring harness. Refer to Section 08 71 00 Door and Hardware for openings that require electrified hardware.
- .3 Refer to Door Schedule for door and screen frame locations, types and required fire ratings.
- .4 Refer to Section 08 71 00 for conditions of the Hardware Allowance.
- .5 Refer to Room Finish Schedule and Drawings for painted and stained finishes.

### **1.2 RELATED SECTIONS**

- .1 Section 07 92 00 - Joint Sealants.
- .2 Section 08 14 16 – Flush Wood Doors
- .3 Section 08 71 00 – Door Hardware.
- .4 Section 08 80 00 - Glass and Glazing.
- .5 Section 09 21 16 - Gypsum Board Assemblies.
- .6 Section 09 91 00 - Painting.
- .7 Division 21 and 26.

### **1.3 REFERENCES**

- .1 ANSI/BHMA A156.115-06: Hardware Preparation in Steel Doors and Frames.
- .2 ANSI/DHI A115.IG-94: Installation Guide for Doors and Hardware.
- .3 ANSI A250.4-01: Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors and Hardware Reinforcing.
- .4 ASTM A568-M-09a: Standard Specification for Steel, Sheet, Carbon, Structural and High-Strength, Low Alloy, Hot Rolled and Cold Rolled, General Requirements for
- .5 ASTM A653/A653M-09a Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-iron Alloy Coated (Galvannealed) by the Hot Dip Process.

- .6 ASTM A924/924M-10: Standard Specification for General Requirements for Steel Sheet, Metallic Coated by the Hot Dip Process.
- .7 ASTM C177-10: Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-plate Apparatus.
- .8 ASTM C518-10: Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
- .9 ASTM C578-10: Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
- .10 ASTM C665-06: Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
- .11 ASTM C1289-10: Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
- .12 ASTM D1622-03: Standard Test Method for Apparent Density of Rigid Cellular Plastics.
- .13 ASTM E90-09: Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- .14 ASTM Classification for Rating Sound Insulation.
- .15 CGSB 41-GP-19Ma: Rigid Vinyl Extrusions for Windows and Doors.
- .16 CAN/CGSB 82-5-M88: Insulated Steel Doors.
- .17 CSA W59-03(08): Welded Steel Construction (Metal Arc Welding)
- .18 CAN/ULC S14-10: Standard Method for Fire Tests of Door Assemblies CAN/ULC S104-M80: Standard Method for Fire Tests of Door Assemblies.
- .19 CAN/ULC S105-09: Standard Specification for Fire Door Frames Meeting The Performance Required by CAN/ULC-S104.
- .20 CAN4 S106-M80 (92): Standard Method for Fire Tests of Window and Glass Block Assemblies.
- .21 CSDMA: Canadian Steel Door Manufacturers Association: Recommended Specifications for Commercial Steel Door and Frame Products, 2006.
- .22 NAAMM: National Association of Architectural Metal Manufacturers.
- .23 HMMA: Hollow Metal Manufacturer's Association.
- .24 NAAMM/HMMA 840-99: Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames.
- .25 NFPA 80-10: Standard for Fire Doors and Other Opening Protectives.
- .26 NFPA 252-08: Standard Methods of Fire Tests of Door Assemblies.
- .27 NFPA 257-07: Standard on Fire Test for Window and Glass Block Assemblies.

#### 1.4 SUBMITTALS FOR REVIEW

- .1 Submit under provisions of Section 01 33 00.
- .2 Product Data: Submit manufacturer's Product specification, construction details, material, finish descriptions and dimensions of individual components. Submit manufacturer's literature, data sheets for each type of material provided under this Section for Project. Data sheets shall provide all required information.
- .3 Shop Drawings:

- .1 Show each type of frame, door, core, metal thicknesses and finishes, openings (glazed and/or louvered), fire ratings, location of exposed fasteners, cutouts, hardware blanking, reinforcing, tapping and drilling arrangements. Show large scale frame sections and anchoring details. Submit door and frame schedule identifying each unit. Ensure each unit bears legible identifying mark corresponding to that listed in Door and Frame Schedule. Fabrication shall not proceed without receipt of reviewed submittal drawings and reviewed hardware schedule.
- .4 Test Reports: Submit following test reports:
  - .1 Steel door and frame assemblies supplied under this Section meet acceptance criteria of ANSI A250.10 and ANSI A250.4, Level "A".
  - .2 Insulated door cores supplied in exterior doors under this Section meet specified thermal resistance rating.
  - .3 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.
  - .4 Submit in addition to fire label, certificate to substantiate design and construction of fire-rated screen assemblies, if required by Consultant or authorities having jurisdiction.
  - .5 Submit a schedule indicating each door and frame related to Door and Frame Schedule.

#### 1.5 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special installation requirements.
- .3 MSDS Sheets.
- .4 Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

#### 1.6 CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.

#### 1.7 ADMINISTRATIVE REQUIREMENTS

- .1 Section 01 31 00: Project management and coordination procedures.
- .2 Coordinate with other work having a direct bearing on work of this section.
- .3 Coordinate work to ensure timely placement of insulation within construction spaces.
- .4 Pre-installation Meetings: Convene two (2) weeks before starting work of this section.
- .5 Sequencing: Sequence installation to ensure wire connections are achieved in an orderly and expeditious manner.

#### 1.8 QUALITY ASSURANCE

- .1 Qualifications: Execute work of this Section by a manufacturer who is a member of CSDFMA.
- .2 Manufacturer's Qualification: Upon request, manufacturer shall provide evidence of having fabricated type of work under this Section for projects of similar size and scope, for a continuous period of not less than five (5) years prior to award of Contract, has personal and plant equipment capable of fabricating steel door and frame Product of types specified and has a written quality control and system in place.

- .3 Product Supplier shall have Architectural Hardware consultant or person of equivalent experience, available at reasonable times to consult with Consultant, Contractor and/or Owner.
- .4 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 Product manufacturers.
  - .1 Be knowledgeable of manufacturers specified in this Section and be familiar with ANSI/NFPA 80 requirements relating to installation of labelled fire rated steel doors, frames and hardware covered under this Section and Section 08 71 00.
- .5 Quality Criteria:
  - .1 All door and frame Product shall meet appropriate requirements of Testing and Performance of these Specifications. Fabricate assemblies on strict accordance with approved submittal drawings.
  - .2 Door and frame Product not in compliance with this Specification may be grounds to reject entire shipment, Supplier and/or manufacturer. Rejected Product shall be replaced at no cost to Owner. Extensions of time or additions to Contract Price will not be considered due to rejection of Product.

## 1.9 SYSTEM DESCRIPTION

- .1 Design Requirements: Ensure Product is manufactured by a firm experienced in design and production of standard and custom commercial door and frame assemblies, integration of builders' or electronic hardware and glazing assemblies and other items affecting work.
- .2 Test and Performance Requirements:
  - .1 Physical Endurance Performance Test for Steel Doors.
  - .2 Test 914mm (3'0") x 2134mm (7'0") x 45mm (1¾") thick normal size door, representative of construction and material provided.
  - .3 Test specimen in accordance with ANSI A250.4, Cycle and Twist Test procedures.
- .3 Cycle Test Acceptance Criteria:
  - .1 Steel stiffened core, continuously welded edge seam doors specified with 16 gauge and heavier face sheets shall be tested to 4,000,000 cycles.
  - .2 Test doors with 18 gauge and heavier face sheets to 1,000,000 cycles.
  - .3 Twist Test Acceptance Criteria: Maximum deflection under 300 pound (126.08kg) load.
  - .4 Steel stiffened core, continuously welded edge seam doors specified with 16 gauge and heavier face sheets shall not exceed 15.88mm (0.625") deflection and maximum permanent deflection shall not exceed 1.57mm (0.062").
  - .5 Doors specified with 18 gauge and heavier face sheets shall not exceed 31.75mm (1.25") deflection and maximum permanent deflection shall not exceed 3.18mm (0.125").
  - .6 Provide Test Reports or Certificates of Companies including description of test specimen, procedures used in testing and indicate compliance with specified acceptance criteria.
- .4 Labelled Fire-Rated or Temperature Rise Rated Doors and Frame product:
  - .1 Provide fire and temperature rise rated steel doors and frame products for those openings as determined and scheduled by Consultant.
  - .2 Provide label of a recognized testing agency having factory inspection service, and constructed as listed or classified for labelling.

- .3 Test doors provided for openings requiring fire rating only, or fire and temperature rise rating in accordance with CAN/ULC S104.
  - .4 Test frames, transom and sidelight assemblies provided for openings requiring fire-rating, in accordance with CAN/ULC S104.
  - .5 Test window frames provided for openings requiring fire-rating in accordance with CAN/ULC S106.
  - .6 Label in accordance with ANSI/NFPA 80, listing organization's policies, and Follow-Up Service Procedures/Manuals.
  - .7 Fire rated door or frame component, not qualifying for labelling due to design, hardware or any other reason, shall be noted in submittal documents, or prior to manufacture of product if hardware, glazing or other options affecting fire-rating are not available at time of submitted Shop Drawings preparation.
- .5 Ensure core materials for exterior doors attains thermal resistance of RSI 1.9 (R 11) when tested in accordance with ASTM C177 or ASTM C518.
  - .6 Product quality shall meet standards set by (CSDMA) Canadian Steel Door and Frame Manufacturers Association.

#### 1.10 DELIVERY, STORAGE AND HANDLING

- .1 Protect doors and frames during shipping and storage.
- .2 Inspect all materials thoroughly upon receipt and report all discrepancies, deficiencies and/or damages immediately in writing to Supplier. Note all damage on carrier's Bill of Lading.
- .3 Make good immediately any damage done. Clean scratches and touch up with rust-inhibitive primer. Replace damaged work which cannot be repaired, restored or cleaned.
- .4 Store in a dry, secure location, on planks or dunnage. Doors and frame products shall be stored in a vertical position, spaced with blocking. Materials shall be covered to protect them from damage but in such a manner as to permit air circulation. Site storage and protection of materials shall be in accordance with NAAMM-HMMA 840.

#### 1.11 WARRANTY

- .1 Warrant work of this Section for period of 1 year against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Consultant and at no expense to Owner. Defects include but are not limited to; buckling, opening of seams, bond failure and extensive colour fading.
- .2 Any door found to be defective or unfit for use under normal conditions will be replaced free of charge by the manufacturer.

### PART 2 PRODUCTS

#### 2.1 MANUFACTURERS

- .1 Products of following manufacturers for steel doors are acceptable subject to conformance to requirements of drawings, schedules and specifications:
  - .1 Artek Door Limited; [www.artekdoor.com](http://www.artekdoor.com)
  - .2 Davbar Industries Limited; [www.daybar.com](http://www.daybar.com)
  - .3 De La Fontaine; [www.delafontaine.com](http://www.delafontaine.com)



- .4 Fleming Door Products Limited; [www.flemingdoor.com](http://www.flemingdoor.com)
- .5 Gensteel Doors; [www.gensteeldoors.com](http://www.gensteeldoors.com)
- .6 Trillium Steel Doors Limited; [www.trilliumsteeldoors.com](http://www.trilliumsteeldoors.com)
- .7 All Steel Doors 2000 Ltd.; [www.allsteeldoors.com](http://www.allsteeldoors.com)

## 2.2 MATERIALS

- .1 Sheet Steel: Interior use shall be commercial grade steel to ASTM A5568M, Class 1, hot-dip galvanized to ASTM A653M, ZF 120 (A40), known commercially as "Galvalume". Steel sheet thickness specified are base metal thicknesses prior to galvanizing.
- .2 Exterior use shall be Galvanized steel conforming to ASTM A653, Commercial Steel (CS), Type B, coating designation Z275 (G90) for steel door faces sheets and frame product profiles.
- .3 Equivalent minimum base steel thicknesses for gauges shall be in accordance with Appendix 1 of CSDMA "Recommended Specifications for Commercial Steel Door and Frame Products".
- .4 Steel shall be free of scale, pitting, coil breaks, surface blemishes, buckles, waves and other defects.
- .5 Stainless steel, Type 304, conforming to ASTM A 666
- .6 Door Cores:
  - .1 Honeycomb: Structural small cell 2.5mm (1") maximum, kraft paper "honeycomb"; weight 36kg (80 lb) per ram (min.), density; 16.5kg/m<sup>3</sup> (1.03 lbs/cu ft) minimum, sanded to required thickness.
  - .2 Polyurethane: foamed in place, density 29kg/m<sup>3</sup> (1.8lbs/cu ft) minimum, containing no urea formaldehyde resins and a minimum R-value of RSI 1.9 (R11).
  - .3 Steel Stiffened, Internally reinforced with 0.64mm (22 ga) interlocking steel stiffeners, securely laminated to each face sheet. Voids between stiffeners shall be injected with polyurethane foam for and a minimum R-value of RSI 1.9 (R11).
- .7 Adhesives:
  - .1 Heat resistant, single component, polyurethane reactive (water) hot melt, thermostat adhesive UL/WH approved.
  - .2 Interlocking Edge Seams: Resin reinforced polychloroprene (RRPC), fire resistant, high viscosity, sealant/adhesive or UL/WH approved.
  - .3 Honeycomb Cores and Steel Components: Heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement.
  - .4 Polyurethane Cores: Heat resistant, epoxy resin based, low viscosity, contact cement.
  - .5 Lock-Seam Doors: Fire resistant, resin reinforced polychloroprene (RRPC), fire resistant high viscosity sealant/adhesive.
- .8 Primer: Rust inhibitive touch-up only.
- .9 Door Silencers (Bumpers): Single stud rubber/neoprene type.
- .10 Fasteners for Stops: Cadmium plated steel, counter sunk flat or oval head sheet metal Phillips screws.

## 2.3 FRAME ANCHORS

- .1 Provide Frame anchor Products with anchorage appropriate to floor, wall and frame construction.

- .2 Floor Anchors:
  - .1 Provide each jamb with 1.52mm (16 ga) steel floor anchors where frame product is installed prior to construction of adjacent wall. Provide each anchor with 2 (two) holes for mounting to floor and securely weld to inside of jamb profile.
- .3 Wall Anchors:
  - .1 Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.
  - .2 Provide 2 anchors per jamb for rebate opening heights up to and including 1524mm (60") and 1 additional anchor per jamb for each additional 760mm (30") of height or fraction thereof, except as noted below. For frames in previously placed concrete, masonry or structural steel provide anchors located not more than 150mm (6") from top and bottom of each jamb and intermediate anchors at 660mm (26") on center maximum.
  - .3 Provide frame products installed in steel stud and drywall partitions with 20 gauge steel snap-in or "Z" stud type anchors. Supply frame anchors to gypsum board installers with directions for installing steel door frames in gypsum board partitions.
  - .4 Provide frame products for installation in new masonry walls with steel adjustable wall anchors or T-strap, stirrup or wire, 16 gauge minimum or 0.156 in. diameter wire. Provide corrugated and/or perforated straps not less than 50mm (2") x 254mm (10") in size.
  - .5 Punch and dimple jambs of frames in previously placed concrete, masonry or structural steel to accept machine bolt anchors, 6.4mm (.25") diameter, located not more than 150mm (6") from the top and bottom of each jamb.
  - .6 Locate anchor preparations and guides immediately above or below intermediate hinge reinforcing and directly opposite on strike jamb. Provide each preparation with 16 gauge anchor bolt guides.
  - .7 Provide anchor bolts and expansion shell anchors for above preparations by Subcontractor responsible for installation.
  - .8 Provide channel extensions from top of frame assembly to underside of structure above on sidelights or windows exceeding 9'-10" in width when installed in stud partitions. Fabricate extensions from 2.66mm (12 ga) steel formed channels, mounting angles and adjusting brackets, with mounting angles welded to inside of frame head. Deliver loose formed adjusting brackets and fasteners. Connect channels mechanically to mounting angles and adjusting brackets with supplied fasteners, on site, by Subcontractor responsible for installation.

## 2.4 STEEL FRAMES

- .1 Fabricate frames for doors, screens and borrowed lights to profiles indicated.
- .2 Reinforce frame as required for surface mounted hardware. For door frames wider than 1500mm (4'-11") reinforce door frame head and jamb and mullions at junction of head.
- .3 Prepare each door opening for single stud door silencers; 3 for single door openings placed opposite hinges; 2 for double door openings approximately 150mm (6") each side of meeting stiles of doors.
- .4 Reinforce all frames for regular, parallel and top jamb mount closers.
- .5 Exterior Frames:
  - .1 Frames shall be fabricated from 1.5mm (14 ga) steel.

- .2 Supply, set up and welded (SUW). Welds shall not cause thermal transfers between interior and exterior surfaces of frame sections.
- .3 Sections shall not be assembled by means of screws, grommets or other fasteners.
- .4 Closed sections such as mullions or center rails shall be factory insulated with specified insulation.
- .5 Install insulation of open sections such as jambs, heads and sills.
- .6 Factory apply touch-up primer to areas where zinc coating has been removed during fabrication.
- .7 Construct door frames of labelled fire doors as detailed in follow-up service procedure/factory inspection manuals issued by nationally recognized listing agency to individual manufacturers and tested in conformance with CAN/ULC S104-M. Ensure ratings for frames match doors as minimum requirement. Locate label on frame jamb on hinge side, so it is concealed when door is closed.
- .8 Provide 4 hinges per door non-symmetrically spaced.
- .6 Sidelight and Window Frame Assemblies:
  - .1 Steel: Minimum 1.5mm thick (16 ga) steel.
  - .2 Supplied set-up and welded (SUW)
  - .3 Glazing stops: Minimum 0.9mm thick (20 ga) steel, formed, drilled and countersunk for fastenings.
- .7 Welded Type Frames:
  - .1 Miter corners of frames. Cut frame miters accurately and weld continuously on returns and inside of frame faces.
  - .2 When required due to site access or due to shipping limitations, fabricate frame product for large openings in sections, with splice joints for field assembly. Indicate joints for field assembly on shop drawings.
  - .3 Accurately cope and securely weld butt joints of mullions, transom bars, center rails and sills. Grind welded joints to a smooth, uniform finish.
  - .4 Securely attach floor anchors to inside of each jamb profile.
  - .5 Weld in 2 temporary jamb spreaders at each frame to maintain alignment during shipment.
  - .6 Use formed channel glazing stops, minimum 16mm (5/8") in height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.
  - .7 Steel frame products shall have frame back boxes provided by section 08 70 00, welded in place by the hollow metal door frame supplier. Refer to section 08 70 00 finish hardware for openings that require electrical hardware

## 2.5 STANDARD DUTY STEEL DOORS

- .1 Standard Duty Interior Steel Doors:
  - .1 Face Sheets: 1.2mm thick (18 ga) minimum uncoated steel sheet.
  - .2 Core: Honeycomb.
  - .3 Longitudinal edges: Mechanically interlocked, tack welded at top and bottom of door, 150mm (6") on center and above and below each edge cutout, filled and ground smooth with no visible seams.

- .4 Glazing Stops: 0.9mm thick (20 ga) minimum uncoated steel sheet, formed, drilled and countersunk for fastenings.
- .2 Standard Duty Interior Fire Rated Steel Doors:
  - .1 Face Sheets: 1.2mm thick (18 ga) minimum uncoated steel sheet.
  - .2 Core: Honeycomb
  - .3 Longitudinal edges: Mechanically interlocked tack welded at top and bottom of door, 150mm (6") on center and above and below each edge cutout, filled and ground smooth with no visible seams.
- .3 Doors (Honeycomb Core Construction):
  - .1 Door faces of all steel doors shall be fabricated without visible seams, free of scale, pitting, coil brakes, buckles and waves.
  - .2 Fabricate each facer sheet for interior door using a sheet steel laminated under pressure to honeycomb core.
  - .3 Formed edges shall be true and straight with minimum radius for thickness of steel used.
  - .4 Lock and hinge edges shall be beveled 3mm in 50mm (1/8" in 2") unless required otherwise to suit finish hardware or door swings.
  - .5 Top and bottom of doors shall be provided with inverted, recessed, 1.5mm thick (16 ga) steel end channels, welded to each face sheet at 50mm (2") on center maximum.
- .4 Glazing:
  - .1 Interior: 20ga glazing kit, baked on powder coat grey primer for field painting. Size and glazing as indicated on drawings. Air Louvers Inc Slimline or equal.
  - .2 Exterior: 20ga glazing kit, electro-galvanized baked on powder coat, colour selected from manufacturer's standard colour selection. Size and glazing as indicated on drawings. Air Louvers Inc VSIG-E, or equal.
- .5 Prime Painting: Apply factory touch up primer at areas where zinc coating has been damaged during fabrication.
- .6 Steel Panels:
  - .1 Panels shall be fabricated from same materials, construction and finished in the same manner as doors as specified in this Section.
- .7 Finish:
  - .1 Remove weld slag and spatter from exposed surfaces.
  - .2 All tool marks, abrasions and surface imperfections shall be filled and sanded to present smooth and uniform surfaces.
  - .3 On exposed surfaces where zinc has been removed during fabrication, product shall receive a factory applied touch-up primer.
  - .4 Primer shall be fully cured prior to shipment.
- .8 Sizes and Tolerances
  - .1 Manufacturing and installation tolerances shall be in accordance with CSDMA "Recommended Dimensional Standards for Commercial Steel Doors and Frames".
- .9 Hardware Locations:
  - .1 Location of hardware on doors and frames products shall be outlined in the finish hardware preamble.

- .2 Hardware preparation tolerances shall comply with the ANSI A115 series standards.
- .10 Metal Louvres:
  - .1 Material: Roll formed steel.
  - .2 Finish: Pre-painted finish, colour to be selected by Consultant.
  - .3 Louvre Blade: Inverted slat blade, and sight proof.
  - .4 Fire Rating: Fire rated as indicated with fusible link design to ULC requirements.
  - .5 Frame: style with tamper proof fasteners.

## 2.6 HARDWARE REINFORCEMENT AND PREPARATIONS

- .1 Door product shall be blanked, reinforced, drilled and tapped at the factory for fully template mortise hardware only, in accordance with the approved hardware schedule and templates provided by the hardware supplier.
- .2 Door products shall be factory blanked and reinforced only for mortised hardware that is not fully templated.
- .3 Where surface mounted hardware, anchor hinges, thrust pivots, pivot reinforced hinges or non-templated hardware applies, frame product shall be reinforced only, with drilling and tapping done by others in the field.
- .4 Doors shall be prepared for 4.5" (114.3mm) standard weight hinges (minimum).
- .5 Hinge reinforcing shall be 3.42mm (10 ga) steel minimum, high frequency type be provided.
- .6 Doors in excess of 96" (2450mm) rabbet height shall be prepared for 4.5" (114.3mm) heavy weight (.180"/4.6mm) hinges minimum.
- .7 Lock, strike and flush bolt reinforcements shall be 16 gauge steel minimum, with extruded tapped holes that provide equivalent number of threads as 12 gauge.
- .8 Closer reinforcing shall be 2.66mm (12 ga) steel minimum.
- .9 Reinforce frame product where surface mounted hardware, anchor hinges, thrust pivots, pivot reinforced hinges or non-templated hardware apply, with drilling and tapping done by others in field.
- .10 Reinforcements are not required for surface applied hardware supplied with thru-bolts and spacers or sex-bolts.
- .11 Cylindrical lock, ASA strike and flush bolt reinforcing shall be 2.66mm (12 ga) steel minimum.
- .12 Templated holes 12.7mm (1/2") diameter and larger shall be factory prepared except mounting and through bolt holes which shall be by Subcontractor responsible for installation on site, at time of application. Templated holes less than 12.7mm (1/2") diameter shall be factory prepared only when required for function of device (for knobs, levers, cylinders, thumb or turn pieces) or when these holes overlap function holes.
- .13 Mortise lock and all other surface mounted hardware reinforcing shall be 1.52 mm (16 ga) steel minimum.
- .14 In masonry or concrete partitions with 0.76mm (22 ga) steel grout guards. Where electrified hardware is specified on approved Hardware Schedule, steel door and frame product shall have CSA approved system consisting of CSA approved conduit, junction boxes wire harnesses complete with modular plugs for coordinated connection directly to electrified hardware. Refer to Section 08 71 00 "Door Hardware" for openings that require electrified hardware unless indicated otherwise.

- .15 Provide all hardware mortises on perimeter frame members shall be grouted.
- .16 Where electrified hardware is specified on approved hardware schedule, steel door product shall be provided with conduit, with pull string, through door from power transfer to electric hardware item which shall be installed in the door prior to shipment to site. Refer to Section 08 71 00 "Finish Hardware" for openings that require electrified hardware.

## 2.7 STEEL FRAME FABRICATION

- .1 Form frames in accordance with details, approved shop drawings, and ULC requirements.
- .2 Mortise, reinforce, drill and tap frames and reinforcements to receive hardware using templates provided.
- .3 Protect strike and hinge reinforcement completely by guard boxes welded to frame.
- .4 Weld in two temporary channel spreaders per frame to ensure proper frame alignment during shipment. Spreader bars to be removed prior to installation of frames.
- .5 Where frames terminate at finish floor, provide floor plates for anchorage to structural slab.
- .6 Cut miters accurately and weld continuously on inside of frame profile.
- .7 Grind welded corners to a flat plane, fill with metallic paste filler and sand to a uniform smooth finish.
- .8 Fill surface depressions and butted joints with metallic paste filler and sand to a uniform smooth finish.
- .9 Reinforce heads of frames wider than 1219mm (4'-0") with 3.4mm (10 GA) reinforcing.
- .10 Provide ULC labels on frames for fire-rated doors.
- .11 Removable glazing stops shall be screw-fixed with countersunk heads.
- .12 Touch up frames by priming areas where galvanizing is damaged prior to delivery.

## 2.8 STEEL DOOR FABRICATION

- .1 Provide ULC labels for all fire-rated doors
- .2 Make provisions for grilles and glass and provide necessary glazing stops. Removable glazing stops shall be screw-fixed with countersunk heads.
- .3 Construct doors in accordance with reviewed shop drawings and ULC requirements Undercut doors where shown on Door Schedule.
- .4 Touch up doors with primer where galvanized finish is damaged during fabrication.
- .5 Permit access by an approved inspection and testing company for purpose of inspecting at random doors under fabrication.
- .6 Welding: CSA W59-M.
- .7 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.
- .8 Fabricate doors to be swing type flush with 1 continuous face free from joints, tool markings and abrasions and with provisions for glass and/or louvre openings as indicated on Door Schedule and Drawings.
- .9 Coordinate louvre openings with Divisions 21, 22 and 23.

- .10 Fabricate exterior doors using polyurethane insulated steel stiffened construction.
- .11 Fabricate interior doors using honeycomb construction.
- .12 For steel stiffened doors longitudinal edges shall have seams continuously welded.
- .13 Fabricate doors with top and bottom inverted recessed spot welded channels.
- .14 Provide welded in place flush steel top cap on exterior doors.
- .15 Reinforce doors for surface mounted hardware.
- .16 Fabricate fire rated door assemblies as detailed in Follow-up Service Procedures/Factory inspection. Manuals issued by nationally recognized listing agency to individual manufacturer and tested in conformance with CAN/ULC S104-M. Provide labels for fire rated doors.
- .17 Fabricate fire rated doors where indicated in Door and Frame schedule or drawings, to meet required maximum temperature rise on unexposed side of door in accordance with OBC and ULC requirements.
- .18 Construct panels to match doors.
- .19 Reinforce panels to prevent oil canning. Install panels with concealed fasteners and reinforce to accommodate hardware as required. Provide door top and rebated matching panel where no transom mullion occurs.
- .20 Provide overlapping astragals welded in place as noted in door hardware sets in Division 08 71 00 section "door hardware" on one leaf and where required by NFPA-80 for fire performance rated or where indicated. Extended minimum  $\frac{3}{4}$ " beyond edge of door on which astragal is mounted.

## **PART 3 EXECUTION**

### **3.1 SITE STORAGE AND PROTECTION**

- .1 Do not remove wraps or covers from doors and frame products until time of installation. The contractor responsible for receiving doors and frame product shall ensure that materials are unloaded, properly stored on planks or dunnage in a dry location and handled in a manner that will prevent damage.
- .2 Store door and frame product in a vertical position, spaced by blocking. Cover materials to protect them from damage and in such a manner as to permit air circulation.

### **3.2 INSTALLATION**

- .1 The Installer is responsible for the following:
  - .1 Prior to installation, check the area of floor on which the frame product is to be installed and within the path of the door swing, for flatness and correct as necessary.
  - .2 Prior to installation, remove temporary spreaders. Check each door and frame product for correct size, swing, fire rating and opening number.
  - .3 Prior to installation, isolate and protect from grout and antifreeze agents, all interior surfaces of perimeter frame product sections to be installed in masonry or concrete walls.
  - .4 During the setting of frame product check and correct as necessary for opening width, opening height, squareness, alignment, twist and plumbness. Maintain installation tolerances within the following limits:

- .1 Opening Width: measured from rabbet to rabbet at top, middle and bottom of frame; + 1.5mm (1/16 in.) - 0.8mm (1/32 in.).
- .2 Opening Height: measured vertically between the frame head rabbet and top of floor or bottom of frame minus jamb extensions at each jamb and across the head; + 1.5mm (1/16 in.) - 0.8mm (1/32 in.).
- .3 Squareness: measured on a line from jamb, perpendicular to frame head; not to exceed 1.5mm (1/16 in.).
- .4 Alignment: measured at jambs on a horizontal line parallel to the plane of the face; not to exceed 1.5mm (1/16 in.).
- .5 Twist: measured at opposite face corners of jambs on parallel lines perpendicular to the plane of the door rabbet; not to exceed 1.5mm (1/16 in.).
- .6 Plumbness: measured at the jambs on a perpendicular line from the head to the floor; not to exceed 1.5mm (1/16 in.).
- .5 Install hardware in accordance with hardware manufacturer's templates and instructions.
- .6 Maintain proper door clearances in accordance with specification above, except for special conditions otherwise noted. Where necessary, metal hinge shims, furnished by installer, are permitted to maintain clearances.
- .7 Install door silencers.
- .8 Install glazing materials in accordance with Section 08 80 00.
- .9 Clearances:
  - .1 Provide a minimum of 0.8mm (1/32 in.) edge clearance for swinging doors in order to provide for the functional operation of the assembly.
  - .2 Between doors and frame product at head and jambs 4.7mm (3/16 in.)
  - .3 Between edges of pairs of doors 4.7mm (3/16 in.).
  - .4 At bottom of door where threshold is used 9.5mm (3/8 in.) from bottom of door to top of threshold.
  - .5 At bottom of door where no threshold is used 19.0mm (¾ in.) above floor.
  - .6 Between bottom of door and nominal surface of floor coverings at fire-rated openings, as provided in ANSI/NFPA 80 12.7mm (1/2 in.).

### 3.3 WORKMANSHIP

- .1 All workmanship shall be first-class in every way, the various parts of the work being accurately fitted and fabricated with surfaces free from warp, wave, buckle or other defects.

### 3.4 ADJUSTING AND CLEAN-UP

- .1 At completion of work of this Section, remove all tools, equipment, surplus materials and debris from job site.



- .2 Cleaning and touch-up: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer. Remove and replace defective work, including doors or frames that are warped, dented, bowed or otherwise unacceptable.
- .3 Adjustment: Adjust doors for proper swing and operation without binding or dragging.

**END OF SECTION**

**PART 1 GENERAL**

- 1.1 SECTION INCLUDES
- 1.2 RELATED SECTIONS
- 1.3 REFERENCES
- 1.4 ADMINISTRATIVE REQUIREMENTS
- 1.5 SUBMITTALS FOR REVIEW
- 1.6 SUBMITTALS FOR INFORMATION
- 1.7 CLOSEOUT SUBMITTALS
- 1.8 QUALITY ASSURANCE
- 1.9 REGULATORY REQUIREMENTS
- 1.10 DELIVERY, STORAGE, AND PROTECTION
- 1.11 WARRANTY

**PART 2 PRODUCTS**

- 2.1 MANUFACTURERS
- 2.2 DOOR LEAF TYPES
- 2.3 DOOR LEAF CONSTRUCTION
- 2.4 DOOR FACING
- 2.5 DOOR EDGES
- 2.6 ADHESIVE
- 2.7 ACCESSORIES
- 2.8 FABRICATION
- 2.9 FINISHES

**PART 3 EXECUTION**

- 3.1 EXAMINATION
- 3.2 INSTALLATION
- 3.3 INSTALLATION TOLERANCES
- 3.4 ADJUSTING

## **PART 1 GENERAL**

### **1.1 SECTION INCLUDES**

- .1 Flush wood doors; Fire-rated.
- .2 Install all hardware supplied under Section 08 71 00. Obtain templates from hardware supplier for accurate shop fabrications. Provide hardware blocking in door as required.
- .3 All glass and glazing in doors shall be supplied and installed under Section 08 80 50.

### **1.2 RELATED SECTIONS**

- .1 Section 06 20 00 - Finish Carpentry
- .2 Section 08 12 13 - Standard Hollow Metal Frames.
- .3 Section 08 71 00 - Door Hardware - General.
- .4 Section 08 80 50 - Glass and Glazing.
- .5 Electrical: Security

### **1.3 REFERENCES**

- .1 ANSI A135.4-2004 - Basic Hardboard.
- .2 ASTM E413-10 - Classification for Rating of Sound Insulation.
- .3 ANSI 280.1-2009 – Particle Board Standards.
- .4 AWMAC – North American Architectural Woodwork Standards (NAAWS) 3.1 2020
- .5 CAN/ULC-S104-10 - Standard Method for Fire Tests of Door Assemblies.
- .6 CAN/ULC-S105-09 - Standard Specification for Fire Door Frames Meeting the Performance Required by CAN/ULC-S104.
- .7 CHPVA (Canadian Hardwood Plywood and Veneer Association).
- .8 HPVA (Hardwood Plywood and Veneer Association).
- .9 NEMA LD3-2005 - High Pressure Decorative Laminates (HPDL).
- .10 NFPA 80 - Standard for Fire Doors and Other Opening Protectives, 2010 Edition.
- .11 NFPA 252 - Fire Tests of Door Assemblies (2008 Edition).

### **1.4 ADMINISTRATIVE REQUIREMENTS**

- .1 Section 01 31 13: Project management and coordination procedures.
- .2 Coordination:
  - .1 Coordinate with other work having a direct bearing on work of this section.
  - .2 Coordinate the work with door opening construction, door frame and door hardware installation.

### **1.5 SUBMITTALS FOR REVIEW**

- .1 Section 01 33 00: Submission procedures.

- .2 Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
- .3 Samples: Submit two (2) samples of the impact-resistant door edge protector, 6 inch long in size illustrating selected colours and finishes.
- .4 Shop Drawings: Illustrate door opening criteria, elevations, sizes, thickness, types, swings, undercuts required, special blocking for hardware and fire rating. Identify cutouts dimensions for glazing and louvres.

#### 1.6 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special installation requirements.

#### 1.7 CLOSEOUT SUBMITTALS

- .1 Section 01 77 00: Submission procedures.

#### 1.8 QUALITY ASSURANCE

- .1 Perform work in accordance with NAAWS, Custom Grade.
- .2 Finish doors in accordance with NAAWS to finish identified in schedule.
- .3 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five (5) years documented experience and a member in good standing with AWMAC.

#### 1.9 REGULATORY REQUIREMENTS

- .1 Fire Rated Door Assembly: Labelled by either ULC or ITS/Warnock Hersey, and shall conform to the requirements of the manufacturer's labelling agency.
- .2 Installed Fire Rated Door Assembly: Conform to NFPA 80 for fire rated class as scheduled .

#### 1.10 DELIVERY, STORAGE, AND PROTECTION

- .1 Section 01 60 00: Transport, handle, store, and protect products.
- .2 Package, deliver and store doors in accordance with NAAWS.
- .3 Accept doors on site in manufacturer's packaging. Inspect for damage.
- .4 Protect doors with resilient packaging. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges [with tinted sealer] if stored more than one week. Break seal on site to permit ventilation.

#### 1.11 WARRANTY

- .1 Section 01 77 00: Warranties.
- .2 Provide warranty to include coverage for failure to meet specified requirements, to the following term:
  - .1 Interior Doors: Manufacturer's standard full lifetime warranty for "full life of original installation"
- .3 Include coverage for delamination of veneer, warping beyond specified installation tolerances, telegraphing core construction, defective materials.

- .4 Any door found to be defective or unfit for use under normal conditions must be replaced by the manufacturer free of charge to the Owner.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- .1 Baillargeon Wood Door; Product: Flush wood doors.
- .2 Other acceptable manufacturers offering functionally and aesthetically equivalent products.
  - .1 Lambton Doors.
  - .2 V.T. Industries.

### 2.2 DOOR LEAF TYPES

- .1 Interior Doors: 1-3/4 inches thick; solid core construction, fire-rating as scheduled.

### 2.3 DOOR LEAF CONSTRUCTION

- .1 Core (Solid, Fire-Rated): NAAWS, Type FD1, mineral core.
- .2 Construct fire-rated doors to the requirements of all applicable labelling agencies.

### 2.4 DOOR FACING

- .1 Plastic Laminate Facing (Interior): Refer to Section 06 20 00 Finish Carpentry
- .2 Cross Banding Behind Laminate Finish: composite crossband. Wood crossband is not permitted.

### 2.5 DOOR EDGES

- .1 Edges for veneered doors shall be Type D of the same species as face veneer. Type B, wood veneered edges are not permitted.
- .2 Edges for doors for opaque finish shall be Type A of a species compatible with face veneer.
- .3 Edges for doors for plastic laminate finish: Impact-resistant door edge protector: "Edgefender", in pattern and colour to match plastic laminate door face.

### 2.6 ADHESIVE

- .1 Facing Adhesive: Type I – waterproof, and shall contain no added urea-formaldehyde resins.

### 2.7 ACCESSORIES

- .1 Wood lite kit as recommended by wood door manufacturer to suit glass thickness and fire-rating.

### 2.8 FABRICATION

- .1 Fabricate non-rated doors in accordance with NAAWS requirements.
- .2 Sound Rating for Single Door Leaf and Frame Assembly: ASTM E413, minimum STC 37.
- .3 Provide lock blocks at for hardware reinforcement as required. Refer to door and hardware schedule.
- .4 Vertical Exposed Edge of Stiles: Of same species as veneer facing, or Plastic laminate same as door facing, finish to be as scheduled.

- .5 Fit door edge trim to edge of stiles after applying veneer facing.
- .6 Bond edge banding to cores.
- .7 Factory machine doors for finish hardware in accordance with hardware requirements and dimensions. Do not machine for surface hardware. Provide solid blocking for through bolted hardware.
- .8 Factory fit doors for frame opening dimensions identified on shop drawings.
- .9 Provide edge clearances in accordance with NAAWS.

## 2.9 FINISHES

- .1 Factory finish doors in accordance with NAAWS Standards.
- .2 Factory finish doors in accordance with approved sample.
- .3 Seal door top edge with sealer to match door facing.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- .1 Section 01 10 00: Verify existing conditions before starting work.
- .2 Verify that opening sizes and tolerances are acceptable.
- .3 Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

### 3.2 INSTALLATION

- .1 Install doors to manufacturer's instructions.
- .2 Install non-rated doors in accordance with NAAWS requirements.
- .3 Install fire-rated doors in accordance with NFPA 80, manufacturer's instructions and to ITS/Warnock Hersey requirements.
- .1 Trim non-rated door width by cutting equally on both jamb edges.
- .2 Trim door height by cutting bottom edges to a maximum of 3/4 inch (19mm). Trim fire door height at bottom edge only, in accordance with fire rating requirements.
- .3 Machine cut for hardware.
- .4 Coordinate installation of doors with installation of frames specified in Section 08 12 13 Standard Hollow Metal Frames and in Section 08 71 00 Finish Hardware.
- .5 Coordinate installation of glass and glazing.
- .6 Install door louvres plumb and level.

### 3.3 INSTALLATION TOLERANCES

- .1 Conform to NAAWS requirements for fit and clearance tolerances.
- .2 Conform to NAAWS requirements for maximum diagonal distortion.

### 3.4 ADJUSTING

- .1 Adjust door for smooth and balanced door movement.

.2 Adjust closer for full closure.

**END OF SECTION**

**PART 1 GENERAL**

- 1.1 SECTION INCLUDES
- 1.2 RELATED SECTIONS
- 1.3 REFERENCES
- 1.4 ADMINISTRATIVE REQUIREMENTS
- 1.5 SUBMITTALS FOR REVIEW
- 1.6 SUBMITTALS FOR INFORMATION
- 1.7 CLOSEOUT SUBMITTALS
- 1.8 QUALITY ASSURANCE
- 1.9 REGULATORY REQUIREMENTS

**PART 2 PRODUCTS**

- 2.1 ACCESS UNITS - WALLS
- 2.2 ACCESS UNITS - CEILINGS
- 2.3 FABRICATION - WALL AND CEILING UNITS (NON-RATED)
- 2.4 FINISHES
- 2.5 FABRICATION – WALL AND CELING UNITS (FIRE RATED)

**PART 3 EXECUTION**

- 3.1 EXAMINATION
- 3.2 INSTALLATION
- 3.3 ADJUSTMENTS AND CLEANING



## **PART 1 GENERAL**

### **1.1 SECTION INCLUDES**

- .1 Access door / panels units in ceilings and walls.

### **1.2 RELATED SECTIONS**

- .1 Section 09 21 16 - Gypsum Board Assemblies: Openings in partitions and ceilings.
- .2 Section 09 51 13 - Acoustic Panel Ceilings: Openings in ceilings.
- .3 Section 09 91 10 - Painting: Field paint finish.
- .4 Division 20-23 - Mechanical components requiring access within walls and ceiling.
- .5 Division 26-28: Electrical components requiring access within walls and ceiling.

### **1.3 REFERENCES**

- .1 ULC - Fire Resistance Directory.

### **1.4 ADMINISTRATIVE REQUIREMENTS**

- .1 Section 01 31 00: Project management and coordination procedures.
- .2 Coordination: Coordinate with other work having a direct bearing on work of this section.
  - .1 Coordinate the work with other work requiring access doors.

### **1.5 SUBMITTALS FOR REVIEW**

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.
- .3 Shop Drawings: Indicate exact position of all access door units.
- .4 Samples: Submit two (2) access panel, 6"x6" in size, illustrating material and finish.

### **1.6 SUBMITTALS FOR INFORMATION**

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special installation requirements, and rough-in dimensions

### **1.7 CLOSEOUT SUBMITTALS**

- .1 Section 01 78 10: Submission procedures.
- .2 Record Documentation: Record actual locations of all access units.

### **1.8 QUALITY ASSURANCE**

- .1 Provide all access panels for the project by the same manufacturer.

### **1.9 REGULATORY REQUIREMENTS**

- .1 Conform to applicable code for fire rated access doors.

- .2 Provide certificate of compliance from authority having jurisdiction indicating approval of fire rated doors.

## PART 2 PRODUCTS

### 2.1 ACCESS UNITS - WALLS

- .1 Non-Fire Rated Access Panel: Extruded aluminum with gypsum board inlay for flush installation.
  - .1 In Gypsum Board on Steel Studs:
    - .1 Product: Baucoplus-II with Bauco Paint-Ready door leaf for 5/8" gypsum inlay and drywall flange, manufactured by Bauco Access Panel Solutions Inc., or approved alternate.
  - .2 Fire Rated Door and Frame Unit: 20 gauge galvanized steel door panel and 26 gauge galvanized frame, to have same rating as wall assembly.
    - .1 In Gypsum Board on Steel Studs:
      - .1 Product: Flush access door with drywall flange and concealed hinges, FW-5015 manufactured by Acudor.

### 2.2 ACCESS UNITS - CEILINGS

- .1 Non-Fire Rated Access Panel: Extruded aluminum with gypsum board inlay for flush installation.
  - .1 In Gypsum Board on Steel Studs or suspended ceiling grid system.
    - .1 Product: Baucoplus-II with Bauco Paint-Ready door leaf for 1/2" gypsum inlay and drywall flange, manufactured by Bauco Access Panel Solutions Inc., or approved alternate.
    - .2 Supply and install an additional two (2) access panels in each patient room for existing services above ceiling.
    - .3 Supply and install additional two (2) access panels in each team station for existing services above ceiling.
  - .2 Fire Rated Door and Frame Unit: 20 gauge Galvanized steel door panel and 26 gauge galvanized frame, to have same rating as ceiling assembly.
    - .1 In Gypsum Board on Steel Stunts, or suspended ceiling grid system:
      - .1 Product: Flush access door with drywall flange and concealed hinges, FWC-5015, manufactured by Acudor.

### 2.3 FABRICATION - WALL AND CEILING UNITS (NON-RATED)

- .1 Overview: Extruded aluminum alloy 6063-T6 frames and supports complete with 5/8" (15.9 mm) or 1/2" (12.7 mm) moisture and mold resistant gypsum board inlay and galvanized internal steel corner reinforcing. Zinc-plated hardened steel screws, free pivot hinge, safety cable with carabineer hook, vinyl screw caps, and EPDM rubber gaskets.
- .2 Frames: Recessed aluminum frame shall provide an edge similar to drywall bead against which the ceiling or wall surface shall be finished allowing a near invisible flush frame finish. Fabricate using 2.8mm thick extruded aluminum alloy 6063-T6 frame, complete with galvanized internal steel corner reinforcing. Frame opening complete with perimeter EPDM gasket maintaining the STC of gypsum board assembly.

- .3 Door: Fabricate using 2.8 mm thick extruded aluminum alloy 6063-T6 frame, screwed in place gypsum board inlay complete with galvanized internal steel corner reinforcing. Exposed top edge of frames shall have a concave meniscus rise to 0.5mm thick to accept finishing compound allowing a near invisible flush frame finish.
- .4 Board: Access panel inlay shall match the wall and ceiling specifications to ensure acoustic integrity.
- .5 Hardware:
  - .1 Hinge: Concealed, galvanized steel free pivot hinge shall allow all doors to open 120 degrees. All access panel doors shall be fully removable and complete with a safety cable to secure doors to panel frames with a safety cable, test rated for 135lb (61kg), nylon coated, with crimp connections and spring snap aluminum carabiner.
  - .2 Hinge Location: To be on the longest side unless specified. When baucoplus-II panels are used in a wall installation, the hinges must be located on the floor side.
  - .3 Latch: Tamper-resistant torx head cam latches.

## 2.4 FINISHES

- .1 Base Metal Protection: Setting-type gypsum finishing compound is recommended. Apply compound separately to the door leaf and surrounding wall or ceiling area up to recessed access panel frame. No taping required. Door shall receive the same finish and paint as the surrounding surfaces. When installed and finished the access panel shall be completely flush with the wall or ceiling surface and only a one sixteenth of an inch shadow gap shall be visible.

## 2.5 FABRICATION – WALL AND CEILING UNITS (FIRE RATED)

- .1 Door: Steel-22 Gauge recessed fitted with 5/8" thick drywall suitable to accept skim coat finish on site.
- .2 Door Frame: Steel-22 Gauge press bent for strength and rigidity with pre-punched flanges for convenient mounting and accepting skim coat finish on site.
- .3 Hinge: Concealed.
- .4 Fire Rating (Ceilings): Meets 90 minutes Fire Resistance Rating in accordance with CAN ULS S101-14, ASTM E119-16 and NFPA 251.
- .5 Latch: Self-latching bolt, operated by flush key
- .6 Finish: Satin coat steel, colour to match adjacent finish.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify that rough openings for door and frame are correctly sized and located.

### 3.2 INSTALLATION

- .1 Install units to manufacturer's written instructions.
- .2 Install frames plumb and level in opening. Secure rigidly in place.
- .3 Position unit to provide convenient access to concealed work requiring access.

### **3.3 ADJUSTMENTS AND CLEANING**

- .1 Adjust panel after installation for proper orientation. Remove drywall compound from hinge, frame and door leaf edge. Clean the frame and door with a damp cloth.
- .2 Remove and replace panels or frames that are warped, bowed, or damaged.

**END OF SECTION**

**PART 1 GENERAL**

- 1.1 SECTION INCLUDES
- 1.2 RELATED SECTIONS
- 1.3 REFERENCES
- 1.4 PRICE AND PAYMENT PROCEDURES
- 1.5 ADMINISTRATIVE REQUIREMENTS
- 1.6 SUBMITTALS FOR REVIEW
- 1.7 SUBMITTALS FOR INFORMATION
- 1.8 CLOSEOUT SUBMITTALS
- 1.9 MAINTENANCE MATERIAL SUBMITTALS
- 1.10 QUALITY ASSURANCE
- 1.11 REGULATORY REQUIREMENTS
- 1.12 DELIVERY, STORAGE, AND PROTECTION
- 1.13 WARRANTY

**PART 2 PRODUCTS**

- 2.1 MATERIALS

**PART 3 EXECUTION**

- 3.1 EXAMINATION
- 3.2 INSTALLATION
- 3.3 FIELD QUALITY CONTROL
- 3.4 ADJUSTING
- 3.5 PROTECTION OF FINISHED WORK

## **PART 1 GENERAL**

### **1.1 SECTION INCLUDES**

- .1 Hardware for doors.
- .2 Thresholds.

### **1.2 RELATED SECTIONS**

- .1 Section 06 41 11 - Architectural Cabinetwork: Cabinet hardware.
- .2 Section 08 12 13 - Standard Hollow Metal Frames.
- .3 Section 08 14 16 - Flush Wood Doors.
- .4 Section 08 42 26 – Interior Aluminum Entrances and Storefronts.
- .5 Division 28 – Electronic Safety and Security: Power supply to electric hardware devices.

### **1.3 REFERENCES**

- .1 CAN4-S104-M80(R1985) - Method for Fire Tests of Door Assemblies.
- .2 CAN/ULC-S132-07 - Standard for Emergency Exit and Emergency Fire Exit Hardware.
- .3 CSDMA (Canadian Steel Door Manufacturers Association).
- .4 DHI (Door and Hardware Institute Canada) - AHC and EHC certification programs.
- .5 DHI (Door Hardware Institute) - A115 series.
- .6 DHI WDHS-3-1996 - Recommended Hardware Locations for Wood Flush Doors.
- .7 BHMA (Builders Hardware Manufacturers Association) - A156 series.
- .8 NFPA 80 - Standard for Fire Doors and Other Opening Protectives, 2010 Edition.
- .9 NFPA 252 - Fire Tests of Door Assemblies (2008 Edition).
- .10 UL 10B-2008 - Fire Tests of Door Assemblies (10th Edition).
- .11 UL 305-1997 - Standard for Panic Hardware (5th Edition).

### **1.4 PRICE AND PAYMENT PROCEDURES**

- .1 Allowances: Payment for the supply only of all Finishing Hardware shall be made from a cash allowance specified in Section 01 00 00.

### **1.5 ADMINISTRATIVE REQUIREMENTS**

- .1 Section 01 21 00: Project management and coordination procedures.
- .2 Coordination: Coordinate with other work having a direct bearing on work of this section.
  - .1 Coordinate the work with other directly affected sections involving manufacture or fabrication of internal reinforcement for door hardware and recessed items.
  - .2 Coordinate Owner's keying requirements during the course of the Work.
- .3 Sequencing: Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

### **1.6 SUBMITTALS FOR REVIEW**

- .1 Section 01 33 00: Submission procedures.

- .2 Shop Drawings:
  - .1 Indicate locations and mounting heights of each type of hardware, schedules, catalogue cuts, electrical characteristics and connection requirements.
  - .2 Submit manufacturer's parts lists and templates.
- .3 Description of Operation:
  - .1 Provide a description of operation for doors:
    - .1 Requiring electrified hardware
    - .2 Along the path of egress.
  - .2 Description shall include:
    - .1 Hardware group c/w list of door numbers.
    - .2 Door default position – closed and locked, open during business hour and closed after hours, always open, etc.
    - .3 Method to request entry.
    - .4 Method to request exit/egress.
    - .5 Door operation upon loss of power.
    - .6 Description of electrified door hardware interfaces with other building control systems.
  - .3 Provide a floor plan showing all doors described, indicating the associated hardware group.

## 1.7 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special installation requirements.

## 1.8 CLOSEOUT SUBMITTALS

- .1 Section 01 77 00: Submission procedures.
- .2 Operation and Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
- .3 Warranty Documentation: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- .4 Record Documentation:
  - .1 Record actual locations of installed cylinders and their key codes.
  - .2 Keys: Deliver with identifying tags to Owner by security shipment direct from hardware supplier.

## 1.9 MAINTENANCE MATERIAL SUBMITTALS

- .1 Section 01 00 00: Maintenance and extra material requirements.
- .2 Tools:
  - .1 Provide special wrenches and tools applicable to each different or special hardware component.
  - .2 Provide maintenance tools and accessories supplied by hardware component manufacturer.

## 1.10 QUALITY ASSURANCE

- .1 Perform Work to the following requirements:
  - .1 BHMA A156 series.
  - .2 DHI - A115 series.
  - .3 DHI WDHS-3.
  - .4 CSDMA.
  - .5 NFPA 80.
  - .6 NFPA 252.
  - .7 UL 10B.
  - .8 UL 305.
  - .9 CAN/ULC-S132.
  - .10 CAN/ULC-S104.
- .2 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five (5) years experience.
- .3 Installer Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience and approved by the manufacturer.
- .4 Hardware Supplier Personnel: Employ an Architectural Hardware Consultant (AHC) to assist in the work of this section. (Upper Canada Hardware).

## 1.11 REGULATORY REQUIREMENTS

- .1 Conform to applicable code for Products requiring electrical connection. Listed and classified by CSA as suitable for the purpose specified and indicated.

## 1.12 DELIVERY, STORAGE, AND PROTECTION

- .1 Section 01 60 00: Transport, handle, store, and protect products.
- .2 Package hardware items individually; label and identify each package with door opening code to match hardware schedule.

## 1.13 WARRANTY

- .1 Section 01 77 00: Warranties.
- .2 Provide five (5) year manufacturer warranty for door closers.

## PART 2 PRODUCTS

### 2.1 MATERIALS

- .1 This Section will include the supply of finishing hardware from a schedule under the direction of the Consultant.
- .2 Finishing hardware fabricated of the same material shall be consistent in colour and finish throughout.
- .3 Supply all necessary screws, bolts, expansion shields, inserts and other items and of same finish and colour as required for a complete installation and for proper functioning.
- .4 The final finishing hardware schedule shall be forwarded to Division 15 and 16 for coordination with mechanical and electrical components of the work.



## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- .1 Section 01 10 00: Verify existing conditions before starting work.
- .2 Verify that doors and frames are ready to receive work and dimensions are as indicated on Shop Drawings.
- .3 Verify that electric power is available to power operated devices and is of the correct characteristics.

### **3.2 INSTALLATION**

- .1 Install hardware to manufacturer's written instructions.
- .2 Use templates provided by hardware item manufacturer.
- .3 Mounting heights for hardware from finished floor to centre line of hardware item, refer to:
  - .1 DHI WDMS-3 and DHI A115 Series.

### **3.3 FIELD QUALITY CONTROL**

- .1 Architectural Hardware Consultant will inspect installation and certify that hardware and installation has been furnished and installed in accordance with manufacturer's written instructions and as specified.

### **3.4 ADJUSTING**

- .1 Adjust hardware for smooth operation.

### **3.5 PROTECTION OF FINISHED WORK**

- .1 Section 01 00 00: Protecting installed work.
- .2 Do not permit adjacent work to damage hardware or finish.

**END OF SECTION**

**PART 1 GENERAL**

- 1.1 SECTION INCLUDES
- 1.2 RELATED SECTIONS
- 1.3 REFERENCES
- 1.4 PERFORMANCE REQUIREMENTS
- 1.5 ADMINISTRATIVE REQUIREMENTS
- 1.6 SUBMITTALS FOR REVIEW
- 1.7 SUBMITTALS FOR INFORMATION
- 1.8 CLOSEOUT SUBMITTALS
- 1.9 MAINTENANCE MATERIAL SUBMITTALS
- 1.10 QUALITY ASSURANCE
- 1.11 ENVIRONMENTAL REQUIREMENTS

**Part 2 PRODUCTS**

- 2.1 FLAT GLASS MATERIALS (GL-)
- 2.2 MASTIC FILMS (MF-)
- 2.3 GLAZING COMPOUNDS
- 2.4 GLAZING ACCESSORIES

**PART 3 EXECUTION**

- 3.1 EXAMINATION
- 3.2 PREPARATION
- 3.3 INSTALLATION - INTERIOR DRY METHOD (TAPE AND TAPE)
- 3.4 INSTALLATION - PLASTIC FILM
- 3.5 MANUFACTURER'S FIELD SERVICES
- 3.6 CLEANING
- 3.7 PROTECTION OF FINISHED WORK

## Part 1 GENERAL

### 1.1 SECTION INCLUDES

- .1 Glass for glazed walls, view windows, and doors, c/w hardware and accessories.
- .2 Fire-rated glass.
- .3 Mastic films for glass.

### 1.2 RELATED SECTIONS

- .1 Section 06 41 11 - Architectural Cabinetwork: Glass material for architectural cabinetwork.
- .2 Section 07 92 00 - Joint Sealants: Sealant and back-up material.
- .3 Section 08 12 13 – Standard Hollow Metal Frames.
- .4 Section 08 14 16 - Flush Wood Doors: Glazed doors.

### 1.3 REFERENCES

- .1 ANSI Z97.1-2009 - Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test.
- .2 ASTM C542-05(2011) - Standard Specification for Lock-Strip Gaskets.
- .3 ASTM C864-05(2011) - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
- .4 ASTM C920-11 - Standard Specification for Elastomeric Joint Sealants.
- .5 ASTM C1036-11e1 - Standard Specification for Flat Glass.
- .6 ASTM C1048-12e1 - Standard Specification for Heat-Treated Flat Glass—Kind HS, Kind FT Coated and Uncoated Glass.
- .7 ASTM C1172-09e1 - Standard Specification for Laminated Architectural Flat Glass.
- .8 ASTM C1193-13 - Standard Guide for Use of Joint Sealants.
- .9 ASTM C1503-08 - Standard Specification for Silvered Flat Glass Mirror.
- .10 ASTM D412-06ae2 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension.
- .11 ASTM D1149-07(2012) - Standard Test Methods for Rubber Deterioration-Cracking in an Ozone Controlled Environment.
- .12 ASTM D2240-05(2010) - Standard Test Method for Rubber Property—Durometer Hardness.
- .13 ASTM E84-12c - Standard Test Method for Surface Burning Characteristics of Building Materials.
- .14 CAN/CGSB 12.1-M90 - Tempered or Laminated Safety Glass.
- .15 CAN/CGSB 12.2-M91 - Flat, Clear Sheet Glass.
- .16 CAN/CGSB 12.3-M91 - Flat, Clear Float Glass.
- .17 CAN/CGSB 12.10-M76 - Glass, Light and Heat Reflecting.
- .18 CAN/CGSB 12.20-M89 - Structural Design of Glass for Buildings.
- .19 CAN/ULC S104-10: Standard Method for Fire Tests of Door Assemblies
- .20 CAN4 S106-M80 (92): Standard Method for Fire Tests of Window and Glass Block Assemblies

- .21 NFPA 80-10: Standard for Fire Doors and Other Opening Protectives
- .22 ULC: Underwriters' Laboratories of Canada Building Materials and Systems Directory, Fire Resistance Directory, Current Edition including Supplements to date
- .23 CGSB 19-GP-5M-84 - Sealing Compound, One Component, Acrylic Base, Solvent Curing.
- .24 GANA (Glass Association of North America).
  - .1 GANA Glazing Manual (2008).
  - .2 GANA Laminated Glazing Reference Manual (2009).
  - .3 GANA Sealant Manual (2008).
- .25 IGMA (Insulating Glass Manufacturers Alliance).

#### 1.4 PERFORMANCE REQUIREMENTS

- .1 Size glass to withstand dead loads and positive and negative live loads acting normal to plane of glass as calculated in accordance with Ontario Building code and GANA guidelines.
- .2 Limit glass deflection to 1/200 or flexure limit of glass with full recovery of glazing materials, whichever is less.
- .3 Switch glass assembly listed by UL in Building Materials Directory or other approved testing laboratory bearing permanent mark of approval.

#### 1.5 ADMINISTRATIVE REQUIREMENTS

- .1 Section 01 31 13: Project management and coordination procedures.

#### 1.6 SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
- .3 Product data on base shoes and top channels specified.
- .4 Samples: Submit two (2) samples of plastic film, 6" x 6" (120x125 mm) in size, illustrating each type, pattern and opacity of film specified.

#### 1.7 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.

#### 1.8 CLOSEOUT SUBMITTALS

- .1 Section 01 77 00: Submission procedures.

#### 1.9 MAINTENANCE MATERIAL SUBMITTALS

- .1 Section 01 77 00: Maintenance and extra material requirements.

#### 1.10 QUALITY ASSURANCE

- .1 Perform Work in accordance with GANA Laminated Glazing Reference Manual and GANA Glazing Manual for glazing installation methods.
- .2 Installer Qualifications: Company specializing in performing the work of this section with minimum five (5) years documented experience.

## 1.11 ENVIRONMENTAL REQUIREMENTS

- .1 Do not install glazing when ambient temperature is less than 10 degrees C (50 degrees).
- .2 Maintain minimum ambient temperature before, during and twenty-four (24) hours after installation of glazing compounds.

## Part 2 Products

### 2.1 FLAT GLASS MATERIALS (GL-)

- .1 Safety Glass (Type GL-1): CAN/CGSB-12.1, clear, tempered; minimum 1/2" (12 mm) thick. All exposed edges to be "flat polish", and siliconed edges to be "flat grind".
- .2 For Types GL-2 and GL-3, refer to Section 06 41 11 ARCHITECTURAL CABINETWORK.
- .3 Fire-rated Glass (Type GL-4): Firelite, Thickness to suit size of opening and appropriate fire rated rating.
- .4

### 2.2 MASTIC FILMS (MF-)

- .1 Manufacturer: 3M
- .2 Product:
  - .1 Fasara Slat – SH2FGSL (Type "MF-1")
  - .2 Fine Crystal – SH2FNCR (Type "MF-2")
- .3 Substitutions: Refer to Section 01 25 00.
- .4 Plastic Film: Polyester type.

### 2.3 GLAZING COMPOUNDS

- .1 Silicone Sealant: ASTM C920, Type S, Grade NS, Class 25, Use 0; single component; neutral curing; non-staining cured Shore A hardness of 15 to 25; colour: clear.
  - .1 Product: Tremsil 600, manufactured by Tremco.

### 2.4 GLAZING ACCESSORIES

- .1 U-channel: CRL UCBS3812SL, roll-in load gasket, 1 3/4" x 1 11/16", brushed stainless steel finish; At top and bottom of glazing where glazing is installed on a sill above floor.
- .2 Square rail: SR4SBS3812SL, 2" x 4", brushed stainless steel finish; At top and bottom of glazing where glazing is full height.
- .3 Lock Strip Gaskets: ASTM C542, ozone-resistant neoprene compound, with lock-strip (zipper) component that friction-fits into position to retain glass pane/unit, reglet type, tensile strength of 14 MPa (2000 psi) tested to ASTM D412, Durometer hardness of 75 tested to ASTM D2240, sized to accommodate glass thickness.
- .4 Setting Blocks: ASTM C864, Option II, Neoprene or EPDM; 80 to 90 Shore A durometer hardness tested to ASTM D2240, length of 1 inch for each sq ft (25 mm for each sq m) of glazing or minimum 4" (100 mm) x width of glazing rabbet space minus 1/16 inch (1.5 mm) x height to suit glazing method and pane weight and area.
- .5 Spacer Shims: ASTM C864, Silicone or Neoprene, 50 to 60 Shore A durometer hardness tested to ASTM D2240, minimum 3 inch (75 mm) long x one half the height of the glazing stop x thickness to suit application, self-adhesive on one face.

- .6 Glazing Tape: Preformed butyl compound with integral resilient tube spacing device; 10 to 15 Shore A durometer hardness tested to ASTM D2240; coiled on release paper; black colour.
- .7 Glazing Gaskets: ASTM C864, Option II, Resilient silicone extruded shape to suit glazing channel retaining slot; clear.

### **Part 3 EXECUTION**

#### **3.1 EXAMINATION**

- .1 Section 01 10 00: Verify existing conditions before starting work.
- .2 Verify that openings for glazing are correctly sized and within tolerance.
- .3 Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

#### **3.2 PREPARATION**

- .1 Clean contact surfaces with solvent and wipe dry.
- .2 Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- .3 Prime surfaces scheduled to receive sealant.
- .4 Install sealant in accordance with manufacturer's written instructions.

#### **3.3 INSTALLATION – FIRE RATED HOLLOW METAL DOORS AND SCREENS:**

- .1 Set glass in fire rated metals doors and screens on continuous setting block with 3mm (1/8") gap between glazing stop glass and embed in glazing compound in accordance with NFPA 80 and OBC requirements. Strike and point exposed joints between metal and glass or Install glass in accordance to ULC tested proprietary methods of installation.

#### **3.4 INSTALLATION - INTERIOR DRY METHOD (TAPE AND TAPE)**

- .1 Cut glazing tape to length and set against permanent stops, projecting 1.5 mm (1/16 inch) above sight line.
- .2 Place setting blocks at 1/4 points with edge block no more than 150 mm (6 inches) from corners.
- .3 Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.
- .4 Place glazing tape on free perimeter of glazing in same manner described above.
- .5 Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
- .6 Knife trim protruding tape.

#### **3.5 INSTALLATION - PLASTIC FILM**

- .1 Install plastic film with adhesive, applied in accordance with film manufacturer's written instructions.
- .2 Place without air bubbles, creases or visible distortion.
- .3 Fit tight to glass perimeter with razor cut edge.

#### **3.6 MANUFACTURER'S FIELD SERVICES**

- .1 Section 01 77 00: Prepare and start components.

- .2 Glass and glazing product manufacturers to provide field surveillance of the installation of their Products.
- .3 Monitor and report installation procedures and unacceptable conditions, if present.

### **3.7 CLEANING**

- .1 Section 01 74 13: Cleaning installed work.
- .2 Remove glazing materials from finish surfaces.
- .3 Remove labels after Work is complete.
- .4 Clean glass and adjacent surfaces.

### **3.8 PROTECTION OF FINISHED WORK**

- .1 Section 01 60 00: Protecting installed work.
- .2 After installation, mark pane with an 'X' by using removable plastic tape or paste.

**END OF SECTION**

**PART 1 GENERAL**

- 1.1 SECTION INCLUDES
- 1.2 RELATED SECTIONS
- 1.3 REFERENCES
- 1.4 SUBMITTALS FOR REVIEW
- 1.5 SUBMITTALS FOR INFORMATION
- 1.6 CLOSEOUT SUBMITTALS
- 1.7 QUALITY ASSURANCE
- 1.8 ENVIRONMENTAL REQUIREMENTS

**PART 2 PRODUCTS**

- 2.1 MATERIALS
- 2.2 ACCESSORIES
- 2.3 MIXES

**PART 3 EXECUTION**

- 3.1 PREPARATION
- 3.2 CLEANING TERRAZZO
- 3.3 PATCHING
- 3.4 RESURFACING TERRAZZO
- 3.5 SEALING
- 3.6 PROTECTION OF FINISHED WORK



## **PART 1 GENERAL**

### **1.1 SECTION INCLUDES**

- .1 Cleaning terrazzo finishes.
- .2 Patching and repairing terrazzo finishes.
- .3 Polishing and sealing terrazzo finishes.

### **1.2 RELATED SECTIONS**

- .1 Section 09 65 10 – Resilient Flooring: Transition strips

### **1.3 REFERENCES**

- .1 ASTM C33/C33M-11 - Standard Specification for Concrete Aggregates.
- .2 ASTM C150-09 - Standard Specification for Portland Cement.
- .3 CSA-A3001-08 - Cementitious Materials for Use in Concrete.
- .4 TTMAC (Terrazzo Tile and Marble Association of Canada) - Specification Guide 09 30 00, Tile Installation Manual 2009-2010.

### **1.4 SUBMITTALS FOR REVIEW**

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Descriptive data and application instructions for cleaner and sealer.
- .3 Samples: Provide two (2) 12 x 12 inch terrazzo samples in matching colour to original terrazzo floor.

### **1.5 SUBMITTALS FOR INFORMATION**

- .1 Section 01 33 00: Submission procedures.
- .2 Qualification Statement: Installer qualifications, including previous projects.

### **1.6 CLOSEOUT SUBMITTALS**

- .1 Section 01 78 10: Submission procedures.

### **1.7 QUALITY ASSURANCE**

- .1 Restorer Qualifications:
  - .1 Company specializing in performing the work of this section with minimum three (3) years documented experience.
  - .2 Successful completion of at least three (3) projects of similar scope and complexity within past five (5) years.

### **1.8 ENVIRONMENTAL REQUIREMENTS**

- .1 Section 01 35 26: Environmental conditions affecting products on site.
- .2 Do not resurface terrazzo at ambient temperatures below 10 degrees Cor above 32 degrees C.

- .3 Maintain this temperature range for 24 hours prior to, during, and for 72 hours after completion of terrazzo resurfacing.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- .1 Portland Cement: CSA-A3001, Type and colour to match existing terrazzo.
- .2 Sand: CSA-A3001, sharp, coarse, screened, clean, and free of deleterious matter, colour to match existing terrazzo.
- .3 Aggregate:
  - .1 Type: Crushed, to match existing terrazzo.
  - .2 Size: Match existing terrazzo.
- .4 Colour Pigments: Alkali-resistant, non-fading mineral pigments.
- .5 Water: Potable, clean, and free of organic matter.

### **2.2 ACCESSORIES**

- .1 Curing Materials: Heavy kraft paper or polyethylene sheeting.
- .2 Terrazzo Cleaner: Specifically produced for use on terrazzo, pH factor between 7 and 10; biodegradable and phosphate free.
- .3 Solvents/Paint Stripper: Capable of removing paints and adhesives without damage to terrazzo.
- .4 Sealer: Penetrating type specifically produced for use on terrazzo, pH factor between 7 and 10, slip-resistant.

### **2.3 MIXES**

- .1 Terrazzo Surfacing: Proportions to match original terrazzo.
- .2 Thoroughly mix dry materials prior to adding water. Add water and mix to workable consistency.

## **PART 3 EXECUTION**

### **3.1 PREPARATION**

- .1 Remove damaged and deteriorated terrazzo without damage to adjacent terrazzo.
- .2 Clean substrate; remove loose and foreign matter that could impair adhesion.

### **3.2 CLEANING TERRAZZO**

- .1 Remove adhesives, stains, and paints using solvents/strippers applied in accordance with manufacturer's instructions. Rinse surfaces with clean water.
- .2 Clean with cold water and detergent solution using fibre brush.
- .3 If detergent solution proves ineffective, clean with terrazzo cleaner:
  - .1 Wet surfaces with clean water.

- .2 Apply terrazzo cleaner to manufacturer's written instructions by brush or roller. Allow to stand on surface for period recommended by manufacturer.
- .3 Rinse thoroughly with clean water.
- .4 Repeat cleaning procedure when required, but do not apply cleaner more than twice.
- .4 Remove paint using paint remover applied to manufacturer's written instructions. Rinse surfaces with clean water.

### 3.3 PATCHING

- .1 Thoroughly saturate surfaces to be patched with clean water.
- .2 Where terrazzo has been completely removed down to substrate, coat substrate with neat cement paste. Do not allow to dry before placing terrazzo.
- .3 Fill holes and voids with terrazzo mix to height of existing terrazzo. Where depth of new terrazzo exceeds 1/2 inch, place terrazzo in multiple layers.
- .4 Trowel smooth and mixture level with existing surfaces.
- .5 Cover terrazzo with paper or sheeting for minimum seven (7) days or until patches develop sufficient strength to prevent lifting and pulling of chips during grinding.
- .6 Grind with 24 or finer grit stones or with comparable diamond plates.
- .7 Grind again with 80 or finer grit stones until grout is removed from surface and terrazzo shows percentage of surface aggregate to match existing.
- .8 Wash floor with clean water and rinse thoroughly. Remove excess rinse water. Apply grout using identical cement and color pigments used in topping; fill voids.

### 3.4 RESURFACING TERRAZZO

- .1 Thoroughly saturate subfloor with clean water.
- .2 Coat substrate with neat cement paste; broom into substrate. Do not allow to dry before placing terrazzo.
- .3 Place terrazzo to thickness to match existing. Trowel mixture level.
- .4 Seed troweled surface with additional chips in same proportions as contained in terrazzo mix, and trowel.
- .5 Roll seeded surface with heavy roller until excess water has been extracted.
- .6 Trowel to uniform, smooth, and level surface.
- .7 Cover terrazzo with paper or sheeting for minimum seven (7) days or until topping develops sufficient strength to prevent lifting and pulling of chips during grinding.
- .8 Grind with 24 or finer grit stones or with comparable diamond plates.
- .9 Grind again with 80 or finer grit stones until grout is removed from surface and terrazzo shows percent of surface aggregate to match existing.
- .10 Wash floor with clean water and rinse thoroughly. Remove excess rinse water. Apply grout using identical cement and colour pigments used in topping; fill voids.

### 3.5 SEALING

- .1 Thoroughly wash surfaces with neutral cleaner. Rinse with clean water and allow to dry.
- .2 Apply sealer to manufacturer's instructions.

### **3.6 PROTECTION OF FINISHED WORK**

- .1 Section 01 60 00: Protecting installed work.
- .2 Provide temporary protection for completed work using non-staining coverings.

**END OF SECTION**

**PART 1 GENERAL**

- 1.1 SECTION INCLUDES
- 1.2 RELATED SECTIONS
- 1.3 REFERENCES
- 1.4 SYSTEM DESCRIPTION
- 1.5 SUBMITTALS FOR REVIEW
- 1.6 SUBMITTALS FOR INFORMATION
- 1.7 QUALITY ASSURANCE

**PART 2 PRODUCTS**

- 2.1 MANUFACTURERS
- 2.2 FRAMING MATERIALS
- 2.3 GYPSUM BOARD MATERIALS
- 2.4 ACCESSORIES

**PART 3 EXECUTION**

- 3.1 EXAMINATION
- 3.2 METAL STUD INSTALLATION
- 3.3 WALL FURRING INSTALLATION
- 3.4 FURRING FOR FIRE RATINGS
- 3.5 CEILING FRAMING INSTALLATION
- 3.6 ACOUSTIC ACCESSORIES INSTALLATION
- 3.7 GYPSUM BOARD INSTALLATION
- 3.8 JOINT TREATMENT
- 3.9 TOLERANCES

## **PART 1 GENERAL**

### **1.1 SECTION INCLUDES**

- .1 Gypsum board and joint treatment.
- .2 Acoustic insulation.
- .3 Cementitious backer board.
- .4 Light gauge metal stud wall and ceiling framing.
- .5 Metal channel ceiling framing.

### **1.2 RELATED SECTIONS**

- .1 Section 05 50 00 - Metal Fabrications: Sheet metal backing for support of all wall mounted fixtures.
- .2 Section 06 10 13 - Wood Blocking and Curbing: Wood blocking for support of all wall mounted fixtures.
- .3 Section 07 21 16 - Blanket Insulation: Acoustic insulation.
- .4 Section 07 84 00 - Firestopping.
- .5 Section 08 12 13 – Standard Hollow Metal Frame.
- .6 Section 08 31 13 - Access Doors and Frames.
- .7 Section 09 51 13 – Acoustic Panel Ceilings: Suspension system for gypsum board ceiling system
- .8 Section 09 91 00 - Painting
- .9 Section 12 12 30 – Art Hanging and Display Systems

### **1.3 REFERENCES**

- .1 ANSI A118.9 - Specifications for Test Methods and Specifications for Cementitious Backer Units.
- .2 ASTM C475/C475M-02 (R2007) - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
- .3 ASTM C557-03(2009)e1 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.
- .4 ASTM C645-09a - Standard Specification for Nonstructural Steel Framing Members.
- .5 ASTM C665-06 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
- .6 ASTM C754-09a - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
- .7 ASTM C840-08 - Standard Specification for Application and Finishing of Gypsum Board.
- .8 ASTM C1002-07 - Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
- .9 ASTM C1047-10a - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.

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- .10 ASTM C1278/C1278M-07a - Standard Specification for Fiber-Reinforced Gypsum Panel.
  - .11 ASTM C1288-99(2010) - Standard Specification for Discrete Non-Asbestos Fiber-Cement Interior Substrate Sheets.
  - .12 ASTM C1325-08b - Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cementitious Backer Units.
  - .13 ASTM C1396/C1396M-09a - Standard Specification for Gypsum Board.
  - .14 ASTM E90-09 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
  - .15 CAN/CGSB-71.25-M88 - Adhesive, for Bonding Drywall to Wood Framing and Metal Studs.
  - .16 CAN/ULC-S101-07 - Standard Methods of Fire Endurance Tests of Building Construction and Materials.
  - .17 CAN/ULC-S102-10 - Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
  - .18 CAN/ULC-S702-09 - Standard for Mineral Fibre Thermal Insulation for Buildings.
  - .19 Gypsum Association GA-214-10 - Recommended Levels of Gypsum Board Finish.
  - .20 Gypsum Association GA-216-10 - Application and Finishing of Gypsum Panel Products.
  - .21 Gypsum Association GA-600-09 - Fire Resistance Design Manual.
  - .22 Gypsum Association GA-801-07 - Handling and Storage of Gypsum Panel Products: A Guide for Distributors, Retailers, and Contractors.
  - .23 UL - Fire Resistance Directory.
  - .24 ULC - Fire Resistance Directory.

#### 1.4 SYSTEM DESCRIPTION

- .1 Acoustic Attenuation for Identified Interior Partitions: Minimum 55 STC to ASTM E90.

#### 1.5 SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data:
  - .1 Provide data on metal framing gypsum board and cementitious backer board.
- .3 Shop Drawings: Indicate special details associated with firestopping seal and acoustic seal for openings, and firestopping

#### 1.6 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special installation requirements.
- .3 Section 01 77 00: Submission procedures.

#### 1.7 QUALITY ASSURANCE

- .1 Perform Work in accordance with ASTM C840.
- .2 Installer Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience.
- .3 Handling Gypsum Board: Comply with GA-801.

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## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- .1 Products of following manufacturers are acceptable subject to conformance to requirements of drawings, schedules and specifications:
  - .1 CGC Inc.;
  - .2 Georgia-Pacific Canada;
  - .3 CertainTeed;

### 2.2 FRAMING MATERIALS

- .1 Studs and Tracks:
  - 1. Studs and Tracks: GA-600, GA-216, ASTM C645; galvanized sheet steel, C shape, with knurled faces. Metal studs in partitions up to 12'-0" high shall be 0.5mm (25 GA) nominal core thickness; Metal studs in partitions higher than 12'-0" shall be at thicknesses conforming to CSSBI's Maximum Height Tables for non-structural, non-composite partition.
- .2 Fasteners: ASTM C1002
- .3 Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

### 2.3 GYPSUM BOARD MATERIALS

- .1 Gypsum Board: ASTM C1396/C1396M, paper-faced; 1 220 mm (48 inches) wide, maximum available length in place; SW edges, ends square cut.
  - .1 Regular core, 16 mm (5/8 inch) thick.
  - .2 Fire rated core, 16 mm (5/8 inch) thick.
- .2 Gypsum Ceiling Board: ASTM C1396/C1396M, paper-faced, regular core, 13 mm (1/2 inch) thick; 1 220 mm (48 inches) wide, maximum available length in place; tapered edges, ends square cut.

### 2.4 ACCESSORIES

- .1 Acoustic Insulation: ASTM C665; Sound attenuating mineral wool (non-combustible), friction fit type, unfaced, 76 mm (3 inches) thick.
- .2 Acoustic Sealant: Non-hardening, non-skinning, for use in conjunction with gypsum board.
- .3 Corner Beads: ASTM C1047, metal corner bead.
- .4 Corner reinforcement: ASTM C1047 and C475, perforated high-strength polymer core coated with water activated adhesive paper on both sides. Used in conjunction with assemblies of gypsum wallboard to protect edges and corners where stainless steel corner guards are not installed.
- .5 Edge Trim: ASTM C1047;
  - .1 Control joint: Prefabricated zinc alloy control joints prepared to suit site conditions.
  - .2 Casing Bead: 18 mil.
- .6 Joint Materials: ASTM C475 .
  - .1 Reinforcing tape, adhesive, and water.
  - .2 Joint compound: Asbestos-free dust-controlled.



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- .7 Gypsum Board Fasteners: ASTM C1002, Type S.
  - .8 Cementitious Board Fasteners: Board manufacturer's purpose made screws, corrosion resistant steel, self-drilling points, counter-sink heads to prevent strip-out, for steel substrate.

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION**

- .1 Section 01 10 00: Verify existing conditions before starting work.
- .2 Verify that site conditions are ready to receive work and opening dimensions are verified on site.

#### **3.2 METAL STUD INSTALLATION**

- .1 Install studs to ASTM C754 and manufacturer's written instructions.
- .2 Metal stud spacing shall be as indicated on partition assembly schedule
- .3 Extend all partitions and stud framing through the ceiling to the structure above, unless indicated otherwise on Partition Assemblies schedule. Maintain clearance under structural building members to avoid deflection transfer to studs. Provide extended leg ceiling runners.
- .4 Door Opening Framing: Install double studs at door frame jambs. Install stud tracks on each side of opening, at frame head height, and between studs and adjacent studs.
- .5 Blocking: Bolt or screw steel channels to studs. Install blocking for support of all wall mounted fixtures.
- .6 Wall openings 48" or wider shall be braced with metal angle, anchored to existing structure above.

#### **3.3 WALL FURRING INSTALLATION**

- .1 Erect furring for direct attachment to concrete walls or existing walls.
- .2 Erect furring channels vertically ; space maximum as scheduled on Construction Assemblies drawing, not more than 100 mm (4 inches) from internal corners . Secure in place on alternate channel flanges at maximum 600 mm (24 inches) on centre.
- .3 Erect metal stud framing tight to walls, attached by adjustable furring brackets in accordance with manufacturer's written instructions.

#### **3.4 FURRING FOR FIRE RATINGS**

- .1 Install furring as required for fire resistance ratings indicated and to GA-600 requirements.

#### **3.5 CEILING FRAMING INSTALLATION**

- .1 Install to manufacturer's written instructions and ASTM C754.
- .2 Coordinate location of hangers with other work.
- .3 Install ceiling framing independent of walls, columns, and above ceiling work.
- .4 Reinforce openings in ceiling suspension system which interrupt main carrying channels or furring channels, with lateral channel bracing. Extend bracing minimum 600 mm (24 inches) past each end of openings.
- .5 Laterally brace entire suspension system.

### 3.6 ACOUSTIC ACCESSORIES INSTALLATION

- .1 Install resilient channels at spacing as indicated on Construction Assemblies drawing. Locate joints over framing members.
- .2 Place acoustic insulation in partitions tight within spaces, around cut openings, behind and around electrical and mechanical items within or behind partitions, and tight to items passing through partitions.
- .3 Install acoustic sealant within partitions in accordance with manufacturer's written instructions.
- .4 Install acoustic sealant at gypsum board perimeter at:
  - .1 Metal Framing: Two (2) beads.
  - .2 Caulk all penetrations of partitions by conduit, pipe, duct work, rough-in boxes and fixtures.
- .5 All acoustical insulation shall run the full height of all partitions to slab or deck above.
- .6 Maintain suitable clearance above bottom of runner track to prevent wicking of all moisture from floor surfaces. Appropriate polyurethane foam insulation to be used in runner tracts to guard against wicking action.

### 3.7 GYPSUM BOARD INSTALLATION

- .1 Install gypsum board in accordance with manufacturer's written instructions.
- .2 Erect single layer board in direction with least number of joints, with ends and edges occurring over firm bearing.
- .3 Erect single layer fire rated gypsum board vertically, with edges and ends occurring over firm bearing.
- .4 Use screws when fastening gypsum board to metal furring or framing.
- .5 Double Layer Applications: Use gypsum backing board for first layer, placed parallel to framing or furring members. Use fire rated gypsum backing board for fire rated partitions and ceilings.
- .6 Secure second layer to first with fasteners. Place second layer parallel to first layer. Offset joints of second layer from joints of first layer.
- .7 Erect exterior gypsum soffit board perpendicular to supports, with staggered end joints over supports.
- .8 Treat cut edges and holes in moisture resistant gypsum board with sealant.
- .9 Place control joints consistent with lines of building spaces.
- .10 Place corner beads at external corners. Use longest practical length. Place edge trim where gypsum board abuts dissimilar materials.
- .11 Install backing board over metal studs to manufacturer's written instructions.
- .12 Apply gypsum board to curved walls in accordance with GA-216.

### 3.8 JOINT TREATMENT

- .1 Finish in accordance with ASTM C840, Level 4.
- .2 Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
- .3 Feather coats on to adjoining surfaces so that camber is maximum 0.8 mm (1/32 inch).
- .4 Taping, filling, and sanding is not required at surfaces behind adhesive applied ceramic tile.

- .5 Fill and finish joints and corners of cementitious backing board.

### 3.9 TOLERANCES

- .1 Maximum Variation of Finished Gypsum Board Surface from True Flatness: 3 mm in 3 m (1/8 inch) in any direction.

END OF SECTION

**PART 1 GENERAL**

- 1.1 SECTION INCLUDES
- 1.2 RELATED SECTIONS
- 1.3 REFERENCES
- 1.4 PERFORMANCE REQUIREMENTS
- 1.5 ADMINISTRATIVE REQUIREMENTS
- 1.6 SUBMITTALS FOR REVIEW
- 1.7 SUBMITTALS FOR INFORMATION
- 1.8 CLOSEOUT SUBMITTALS
- 1.9 MAINTENANCE MATERIAL SUBMITTALS
- 1.10 QUALITY ASSURANCE
- 1.11 REGULATORY REQUIREMENTS
- 1.12 ENVIRONMENTAL REQUIREMENTS

**PART 2 PRODUCTS**

- 2.1 MANUFACTURERS - SUSPENSION SYSTEM FOR GYPSUM BOARD CEILING
- 2.2 MATERIALS
- 2.3 MANUFACTURERS - SUSPENSION SYSTEM FOR ACOUSTIC UNIT MATERIALS
- 2.4 MATERIALS
- 2.5 MANUFACTURERS - ACOUSTIC UNIT MATERIALS
- 2.6 MATERIALS
- 2.7 ALTERNATE PRICE #3 AND #4
- 2.8 ACCESSORIES

**PART 3 EXECUTION**

- 3.1 EXAMINATION
- 3.2 INSTALLATION - LAY-IN GRID SUSPENSION SYSTEM
- 3.3 INSTALLATION - ACOUSTIC UNITS
- 3.4 ERECTION TOLERANCES

## **PART 1 GENERAL**

### **1.1 SECTION INCLUDES**

- .1 Suspended metal grid ceiling system and perimeter trim.
- .2 Acoustic tile.
- .3 Acoustic insulation.

### **1.2 RELATED SECTIONS**

- .1 Section 08 31 13 - Access Doors and Frames: Access panels.
- .2 Section 09 21 16 - Gypsum Board Assemblies: partition system and gypsum ceiling.
- .3 Division 21 - Fire Suppression: Sprinkler heads in ceiling system.
- .4 Division 23 - Heating, Ventilating, and Air-Conditioning (HVAC): Air diffusion devices in ceiling system.
- .5 Division 26 – Electrical: Light fixtures in ceiling system.
- .6 Speakers in ceiling system.
- .7 Fire alarm components in ceiling system.
- .8 Patient lifts in ceiling system.

### **1.3 REFERENCES**

- .1 ASTM C635/C635M-12 - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
- .2 ASTM C636/C636M-08 - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
- .3 ASTM C665-12 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
- .4 ASTM E580/E580M-11b - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions.
- .5 ASTM E1264-08e1 - Standard Classification of Acoustical Ceiling Products.
- .6 CAN/CGSB-92.1-M89 - Sound Absorptive Prefabricated Acoustical Units.
- .7 CAN/ULC-S702-09 - Standard for Mineral Fibre Thermal Insulation for Buildings (Includes Amendment 1, 2012).
- .8 AWCCBC (Association of Wall and Ceiling Contractors of British Columbia).
- .9 UL - Fire Resistance Directory.
- .10 ULC - Fire Resistance Directory.

### **1.4 PERFORMANCE REQUIREMENTS**

- .1 Install ceilings within 3 mm (1/8") of dimensional height above floor unless approved otherwise, and level with a maximum tolerance of 3 mm (1/8") in 3 m (10'-0").
- .2 Suspension System: Maximum deflection of 1:360 for acoustic ceiling system including integral mechanical and electrical components.

## 1.5 ADMINISTRATIVE REQUIREMENTS

- .1 Section 01 31 13: Project management and coordination procedures.
- .2 Sequencing:
  - .1 Sequence work to ensure acoustic ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
  - .2 Install acoustic units after interior wet work is dry.

## 1.6 SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide data on metal grid system components and acoustic units.
- .3 Shop Drawings: Indicate grid layout and related dimensioning, junctions with other work or ceiling finishes, interrelation of structural, mechanical and electrical items related to system.
- .4 Samples:
  - .1 Submit two (2 samples, 100mm (4 inch) square in size, illustrating material and finish of acoustic units.
  - .2 Submit two (2) samples each, 300mm (12 inches) long, of suspension system.

## 1.7 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special installation requirements, including perimeter conditions requiring special attention.

## 1.8 CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.

## 1.9 MAINTENANCE MATERIAL SUBMITTALS

- .1 Section 01 77 00: Maintenance and extra material requirements.
- .2 Extra Stock Materials: Provide 10% tile to Owner.

## 1.10 QUALITY ASSURANCE

- .1 Conform to AWCCBC requirements.
- .2 Grid and Acoustic Unit Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five (5) years documented experience.
- .3 Grid and Acoustic Unit to be supplied by the same manufacturer.

## 1.11 REGULATORY REQUIREMENTS

- .1 Conform to applicable code for fire rated assembly and combustibility requirements for materials.

## 1.12 ENVIRONMENTAL REQUIREMENTS

- .1 Section 01 60 00: Environmental conditions affecting products on site.
- .2 Maintain uniform temperature of minimum 16 degrees C (60 degrees F), and maximum humidity of 40% prior to, during, and after acoustic unit installation.

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## PART 2 PRODUCTS

### 2.1 MANUFACTURERS - SUSPENSION SYSTEM FOR GYPSUM BOARD CEILING

- .1 CGC, Product: USG DGLW/DGW
- .2 Other acceptable manufacturers offering functionally and aesthetically equivalent products.
  - .1 Armstrong
  - .2 Certainteed
- .3 Substitutions: Refer to Section 01 25 00.

### 2.2 MATERIALS

- .1 Non-fire Rated Grid: ASTM C635/C635M, heavy duty; exposed T components die cut and interlocking.
- .2 Grid Materials: Commercial quality heavy duty cold rolled steel with hot dipped galvanized coating.
- .3 Grid Surface Width: 1 ½".
- .4 Grid Height 1 ½"
- .5 Grid Finish: Colour White.
- .6 Support Channels and Hangers: Galvanized steel; size and type to suit application.
- .7 For gypsum board ceiling material, refer to SECTION 09 21 16 - Gypsum Board Assemblies.

### 2.3 MANUFACTURERS - SUSPENSION SYSTEM FOR ACOUSTIC UNIT MATERIALS

- .1 CGC, Product: USG DX/DXL
- .2 Other acceptable manufacturers offering functionally and aesthetically equivalent products.
  - .1 Armstrong
  - .2 Certainteed
- .3 Substitutions: Refer to Section 01 25 00.

### 2.4 MATERIALS

- .1 Non-fire Rated Grid: ASTM C635/C635M, heavy duty; exposed T components die cut and interlocking.
- .2 Grid Materials: Commercial quality cold rolled steel with galvanized coating.
- .3 Exposed Grid Surface Width: 15/16 inch.
- .4 Grid Finish: Colour White.
- .5 Accessories: hold down clips and perimeter moldings required for suspended grid system.
- .6 Support Channels and Hangers: Galvanized steel; size and type to suit application.

### 2.5 MANUFACTURERS - ACOUSTIC UNIT MATERIALS

- .1 CGC, Product: Halcyon Healthcare w/ ClimaPlus
- .2 Other acceptable manufacturers offering functionally and aesthetically equivalent products.
  - .1 Armstrong
  - .2 Certainteed

- .3 Substitutions: Refer to Section 01 25 00.

## 2.6 MATERIALS

- .1 Acoustic Tile: ASTM E1264 conforming to the following:
  - .1 Modular Size: 24 x 48 inches.
  - .2 Thickness: 1" inch.
  - .3 Composition: Fibreglass with membrane faced overlay.
  - .4 Light Reflectance: 90% min.
  - .5 NRC: 0.95.
  - .6 Fire Hazard Classification: A.
  - .7 Edge: Square.
  - .8 Surface Colour: White.
  - .9 Surface Finish: Fine texture.

## 2.7 ALTERNATE PRICE #3 AND #4

- .1 Product: Monolithic sound absorbing gypsum board system.
  - .1 CGC, ensemble with acoustical backer panel.

## 2.8 ACCESSORIES

- .1 Mineral Wool Sound Attenuating Insulation: CAN/ULC-S702, friction fit type, unfaced; 50 mm (2 inch) thick, size cut to fit acoustic system.
- .2 Acoustic Sealant: For perimeter moldings, as specified in Section 07 92 00.
- .3 Gaskets (for perimeter moldings): Closed cell rubber sponge tape.
- .4 Touch-up Paint: Type and colour to match acoustic and grid units.
- .5 Wall molding: L-shaped angle moldings.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- .1 Section 01 10 00: Verify existing conditions before starting work.
- .2 Verify that layout of hangers will not interfere with other work.

### 3.2 INSTALLATION - LAY-IN GRID SUSPENSION SYSTEM

- .1 Install suspension system to manufacturer's written instructions, and as supplemented in this section.
- .2 Install system capable of supporting imposed loads to a deflection of 1/360 maximum.
- .3 Locate system on room axis according to reflected plan.
- .4 Install after major above ceiling work is complete. Coordinate the location of hangers with other work.
- .5 Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.



- .6 Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected related carrying channels to span the extra distance.
- .7 Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability. Support fixture loads by supplementary hangers located within 150 mm (6 inches) of each corner; or support components independently.
- .8 Do not eccentrically load system, or produce rotation of runners.
- .9 Perimeter Molding:
  - .1 Install edge molding at intersection of ceiling and vertical surfaces with continuous gasket, and into bed of acoustic sealant where specified on drawings.
  - .2 Provide flexible molding on curved walls.
  - .3 Use longest practical lengths.
  - .4 Mitre corners.
  - .5 Provide molding at junctions with other interruptions.

### 3.3 INSTALLATION - ACOUSTIC UNITS

- .1 Install acoustic units to manufacturer's written instructions.
- .2 Fit acoustic units in place, free from damaged edges or other defects detrimental to appearance and function.
- .3 Lay directional patterned units one way as indicated on drawings. Fit border trim neatly against abutting surfaces.
- .4 Install units after above ceiling work is complete.
- .5 Install acoustic units level, in uniform plane, and free from twist, warp, and dents.
- .6 Cutting Acoustic Units:
  - .1 Cut to fit irregular grid and perimeter edge trim.
  - .2 Cut edges to field cut units to match adjacent units.
  - .3 Double cut and field paint exposed edges of tegular units.
- .7 Where bullnose concrete block corners occur, provide preformed closures to match perimeter molding.
- .8 Lay acoustic insulation for a distance of 1 200 mm (48 inches) either side of acoustic partitions.

### 3.4 ERECTION TOLERANCES

- .1 Maximum Variation from Flat and Level Surface: 3 mm in 3 m (1/8 inch in 10 ft).
- .2 Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION

**PART 1 GENERAL**

- 1.1 SECTION INCLUDES
- 1.2 RELATED SECTIONS
- 1.3 REFERENCES
- 1.4 SUBMITTALS FOR REVIEW
- 1.5 SUBMITTALS FOR INFORMATION
- 1.6 CLOSEOUT SUBMITTALS
- 1.7 MAINTENANCE MATERIAL SUBMITTALS
- 1.8 QUALITY ASSURANCE
- 1.9 REGULATORY REQUIREMENTS
- 1.10 DELIVERY, STORAGE, AND PROTECTION
- 1.11 ENVIRONMENTAL REQUIREMENTS
- 1.12 WARRANTY

**PART 2 PRODUCTS**

- 2.1 MANUFACTURER – RUBBER SHEET FLOORING
- 2.2 MATERIALS – RUBBER SHEET FLOORING
- 2.3 MANUFACTURER - SHEET FLOORING (ALTERNATE PRICE NO. 1 – See SECTION 00 43 23)
- 2.4 MATERIALS - SHEET FLOORING (ALTERNATE PRICE NO. 1 – See SECTION 00 43 23)
- 2.5 ACCESSORIES

**PART 3 EXECUTION**

- 3.1 EXAMINATION
- 3.2 PREPARATION
- 3.3 INSTALLATION - SHEET FLOORING
- 3.4 INSTALLATION - BASE
- 3.5 CLEANING
- 3.6 PROTECTION OF FINISHED WORK

## **PART 1 GENERAL**

### **1.1 SECTION INCLUDES**

- .1 Resilient sheet flooring.
- .2 Resilient base and base accessories.
- .3 Transition strips.

### **1.2 RELATED SECTIONS**

- .1 Section 00 43 23 – Alternate Prices Bid Form Supplement: Alternate price.
- .2 Section 02 41 19 – Selective Demolition: Floor substrate surface.
- .3 Section 06 41 11 – Architectural Cabinet Work: wall base on millwork.
- .4 Section 09 21 16 - Gypsum Board Assemblies: Wall materials to receive application of base.

### **1.3 REFERENCES**

- .1 ASTM E84-10b - Standard Test Method for Surface Burning Characteristics of Building Materials.
- .2 ASTM F1066-04(2010)e1 - Standard Specification for Vinyl Composition Floor Tile.
- .3 ASTM F1303-04(2009) - Standard Specification for Sheet Vinyl Floor Covering with Backing.
- .4 ASTM F1700-04(2010) - Standard Specification for Solid Vinyl Floor Tile.
- .5 ASTM F1859-10 - Standard Specification for Rubber Sheet Floor Covering Without Backing.
- .6 ASTM F1860-10 - Standard Specification for Rubber Sheet Floor Covering With Backing.
- .7 ASTM F1861-08 - Standard Specification for Resilient Wall Base.
- .8 ASTM F1913-04(2010) - Standard Specification for Vinyl Sheet Floor Covering Without Backing.
- .9 ASTM F2034-08 - Standard Specification for Sheet Linoleum Floor Covering.
- .10 ASTM F2169-02(2008) - Standard Specification for Resilient Stair Treads.
- .11 CAN/ULC-S102.2-10 - Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings and Miscellaneous Materials and Assemblies.

### **1.4 SUBMITTALS FOR REVIEW**

- .1 Section 01 33 00: Submission procedures.
- .2 Acceptance of substrate by Installer and Flooring Manufacturer: Provide Letters of Acceptance in writing by installer and flooring manufacturer confirming that the existing substrate is acceptable for installation of new flooring material.
- .3 Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns and colours available.
- .4 Shop Drawings: Indicate seaming plan and pattern
- .5 Samples:
  - .1 Submit two (2) square samples, 600 mm (24 inch) in size illustrating colour and pattern for each floor material for each colour specified.

- .2 Submit two (2) 300 mm (12 inch) long samples of base material for each colour specified.
- .3 Submit two (2) 300mm (12 inch) long samples of fillet support strip.
- .4 Submit two (2) 300MM (12 inch) long samples of colour matched welding thread.

#### 1.5 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special installation requirements including special procedures, perimeter conditions requiring special attention.

#### 1.6 CLOSEOUT SUBMITTALS

- .1 Section 01 77 00: Submission procedures.
- .2 Operation and Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

#### 1.7 MAINTENANCE MATERIAL SUBMITTALS

- .1 Section 01 78 40: Maintenance and extra material requirements.
- .2 Extra Stock Materials: Provide 10% of flooring, 10% of base of each material specified.

#### 1.8 QUALITY ASSURANCE

- .1 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience.
- .2 Installer Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience and approved by the manufacturer.

#### 1.9 REGULATORY REQUIREMENTS

- .1 Conform to applicable code for flame/smoke rating requirements to CAN/ULC-S102.2.

#### 1.10 DELIVERY, STORAGE, AND PROTECTION

- .1 Section 01 61 00: Transport, handle, store, and protect products.
- .2 Protect roll materials from damage by storing on end.

#### 1.11 ENVIRONMENTAL REQUIREMENTS

- .1 Section 01 60 00: Environmental conditions affecting products on site.
- .2 Store materials for three days prior to installation in area of installation to achieve temperature stability.
- .3 Maintain ambient temperature required by adhesive manufacturer three (3) days prior to, during, and twenty-four (24) hours after installation of materials.

#### 1.12 WARRANTY

- .1 Section 01 00 00: Warranties.
- .2 Provide a ten (10) year warranty to include excessive wear under normal usage.

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## PART 2 PRODUCTS

### 2.1 MANUFACTURER – RUBBER SHEET FLOORING

- .1 Mondo; Product: KAYAR Resilient rubber flooring
- .2 Substitutions: Not permitted.

### 2.2 MATERIALS – RUBBER SHEET FLOORING

- .1 Rubber Sheet without Backing: ASTM F1859, 100% rubber composition
  - .1 Total Thickness: 1/8inch (3 mm)
  - .2 Wear Layer Thickness: 0.118" (1mm)
  - .3 Sheet Width: 6'-2" (1.9m)
  - .4 Surface Texture: Smooth
  - .5 Weld Rod: Provide matching weld rod produced by manufacturer of the resilient flooring for heat welding of seams.
  - .6 Colour: As noted on drawing A-701.
- .2 Integral flash cove base: Extend sheet flooring 4" up the wall on pre-manufactured fillet support strip with a minimum radius of 1/2 inch of aluminum.

### 2.3 MANUFACTURER - SHEET FLOORING (ALTERNATE PRICE NO. 1 – See SECTION 00 43 23)

- .1 Forbo; Product: ETERNAL WOOD Commercial Heterogeneous Vinyl Sheet Flooring
- .2 Substitutions: Not permitted.

### 2.4 MATERIALS - SHEET FLOORING (ALTERNATE PRICE NO. 1 – See SECTION 00 43 23)

- .1 Vinyl Sheet with Backing: ASTM F1303:
  - .1 Core: Non woven, fully impregnated, glass fused core.
  - .2 Vinyl Wear Thickness: 0.7mm.
  - .3 Total Thickness: 2 mm.
  - .4 Sheet Width: 6.56' (2m).
  - .5 Surface Texture: Pur Wood Pearl
  - .6 Weld Rod: Provide matching weld rod produced by manufacturer of the resilient flooring for heat welding of seams.
  - .7 Colour: As noted in SECTION 00 43 23 – ALTERNATE PRICE NO. 1.
- .1 Integral flash cove base: Extend sheet flooring 4" up the wall on pre-manufactured fillet support strip with a minimum radius of 1/2 inch of aluminum.

### 2.5 ACCESSORIES

- .1 Subfloor Filler: Provide Portland cement-based latex underlayment or patch and skim coat as recommended by the resilient flooring manufacturer.
- .2 Adhesives: Provide adhesive recommended by rubber sheet flooring manufacturer.
- .3 Top trim caps: Provide top edge trim caps of stainless steel for integral flash cove as provided by fillet support strip manufacturer.
- .4 Transition Strips: Provide stainless steel transition/reducing strips tapered to meet abutting materials.

- .5 Fillet Support Strip: "FlashCove Pre-fabricated Base" by FlashCove.

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION**

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify concrete floors are dry to a maximum moisture content of 3%, and exhibit negative alkalinity, carbonization, or dusting.
- .3 Verify floor and lower wall surfaces are free of substances that may impair adhesion of new adhesive and finish materials.

#### **3.2 PREPARATION**

- .1 Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with a skim coat (up to 1/4" thick) to achieve smooth, flat, hard surface for new flooring.
- .2 Prohibit traffic until filler is cured.
- .3 Vacuum clean substrate.
- .4 Apply moisture barrier on all new and existing slab-on-grade substrate. Moisture barrier to be compatible with adhesive and approved by flooring manufacturer.

#### **3.3 INSTALLATION - SHEET FLOORING**

- .1 Install sheet flooring to manufacturer's written instructions.
- .2 Spread only enough adhesive to permit installation of materials before initial set.
- .3 Set flooring in place, press with heavy roller to attain full adhesion.
- .4 Lay flooring with joints and seams in accordance with seaming plan.
- .5 Install sheet flooring parallel to long axis of room. Provide minimum of one third (1/3) full roll width. Double cut sheet; provide continuously heat welded seal.
- .6 Terminate flooring at centreline of door openings where adjacent floor finish is dissimilar.
- .7 Install edge strips at unprotected or exposed edges, and where flooring terminates.
  - .1 Secure metal strips with stainless steel screws.
  - .2 Secure resilient strips by adhesive.
- .8 Turn up flooring to form base. Back floor and vertical junction with pre-manufactured fillet strip. Provide top cap strip to terminate base.
- .9 Turn up flooring to walls, columns, cabinets, floor outlets, and other appurtenances.
- .10 Install flooring in pan type floor access covers. Maintain floor pattern.
- .11 At movable partitions install flooring under partitions without interrupting floor pattern.
- .12 Fit joints tightly.

#### **3.4 INSTALLATION - BASE**

- .1 Fit joints tight and vertical. Maintain minimum measurement of 450 mm (18 inches) between joints.

- .2 Mitre internal corners. At external corners, 'V' cut back of base strip to 2/3 of its thickness and fold.
- .3 Install base on pre-manufactured fillet backing. Bond tight to wall and floor surfaces.
- .4 Scribe and fit to door frames and other interruptions.

### **3.5 CLEANING**

- .1 Section 01 74 00: Cleaning installed work.
- .2 Remove access adhesive from floor, base, and wall surfaces without damage.
- .3 Clean, seal, and wax floor and base surfaces in accordance with manufacturer's written instructions.

### **3.6 PROTECTION OF FINISHED WORK**

- .1 Section 01 78 40: Protecting installed work.
- .2 Prohibit traffic on floor finish for forty-eight (48) hours after installation.

**END OF SECTION**

**PART 1 GENERAL**

- 1.1 SECTION INCLUDES
- 1.2 RELATED SECTIONS
- 1.3 REFERENCES
- 1.4 SUBMITTALS FOR REVIEW
- 1.5 SUBMITTALS FOR INFORMATION
- 1.6 CLOSEOUT SUBMITTALS
- 1.7 MAINTENANCE MATERIAL SUBMITTALS
- 1.8 QUALITY ASSURANCE
- 1.9 REGULATORY REQUIREMENTS
- 1.10 DELIVERY, STORAGE, AND PROTECTION
- 1.11 ENVIRONMENTAL REQUIREMENTS

**PART 2 PRODUCTS**

- 2.1 MANUFACTURERS - PAINT
- 2.2 MATERIALS
- 2.3 FINISHES

**PART 3 EXECUTION**

- 3.1 EXAMINATION
- 3.2 PREPARATION
- 3.3 APPLICATION
- 3.4 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT
- 3.5 FIELD QUALITY CONTROL
- 3.6 CLEANING
- 3.7 SCHEDULE - INTERIOR SURFACES



## **Part 1 GENERAL**

### **1.1 SECTION INCLUDES**

- .1 Paint coatings and stains.
- .2 Surface preparation.
- .3 Field application.

### **1.2 RELATED SECTIONS**

- .1 Section 05 50 00 - Metal Fabrications: Shop primed items.
- .2 Section 08 11 13 – Metal Doors and Frames: Shop coat for hollow metal doors and pressed metal frames.
- .3 Section 09 21 16 – Gypsum board assemblies: gypsum board finishes.
- .4 Section 20 05 10 – Mechanical: Mechanical identification.
- .5 Section 26 05 00 – Electrical identification.

### **1.3 REFERENCES**

- .1 MPI (Master Painters Institute) – Architectural Painting Specifications Manual and Maintenance Repainting Manual.
- .2 NACE (National Association of Corrosion Engineers).
- .3 OPCA (Ontario Painting Contractors Association) - Architectural Painting Specification Manual.
- .4 SSPC (The Society for Protective Coatings) - Steel Structures Painting Manual.

### **1.4 SUBMITTALS FOR REVIEW**

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide data on all finishing products.
- .3 Samples: Submit two (2) samples, 215x280 mm (8.5"x11") in size illustrating selected colours and finishes for each surface finishing product scheduled.

### **1.5 SUBMITTALS FOR INFORMATION**

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special installation requirements indicating special surface preparation procedures, substrate conditions requiring special attention, and VOC emission.

### **1.6 CLOSEOUT SUBMITTALS**

- .1 Section 01 77 00: Submission procedures.

### **1.7 MAINTENANCE MATERIAL SUBMITTALS**

- .1 Section 01 77 00: Maintenance and extra material requirements.
- .2 Extra Stock Materials:
  - .1 Provide four (4) litres of each colour to Owner.

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- .2 Label each container with colour, type, texture, and room locations in addition to the manufacturer's label.

## 1.8 QUALITY ASSURANCE

- .1 Conform to MPI painting specification manual.
- .2 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience.
- .3 Installer Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience.

## 1.9 REGULATORY REQUIREMENTS

- .1 Conform to applicable code for flame and smoke rating requirements for finishes.

## 1.10 DELIVERY, STORAGE, AND PROTECTION

- .1 Section 01 60 00: Transport, handle, store, and protect products.
- .2 Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- .3 Container label to include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, colour designation, and written instructions for mixing and reducing.
- .4 Store paint materials at minimum ambient temperature of 7 degrees C (45 degrees F) and a maximum of 32 degrees C (90 degrees F), in ventilated area, and as required by manufacturer's written instructions.

## 1.11 ENVIRONMENTAL REQUIREMENTS

- .1 Section 01 60 00: Environmental conditions affecting products on site.
- .2 Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- .3 Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
- .4 Minimum Application Temperatures for Latex Paints: 7 degrees C (45 degrees F) for interiors; 10 degrees C (50 degrees F) for exterior; unless required otherwise by manufacturer's written instructions.
- .5 Minimum Application Temperature for Varnish Finishes: 21 degrees C (70 degrees F) for interior or exterior, unless required otherwise by manufacturer's written instructions.
- .6 Provide lighting level of 860 lx (80 ft candles) measured mid-height at substrate surface.

## Part 2 Products

### 2.1 MANUFACTURERS - PAINT

- .1 Manufacturer: Dulux.
- .2 Other acceptable manufacturers offering functionally and aesthetically equivalent products.
  - .1 Benjamin Moore.
  - .2 Glidden Company.
  - .3 Sherwin-Williams.

- .3 Substitutions: Refer to Section 01 25 00.
- .4 Interior paints shall be zero VOC.

## 2.2 MATERIALS

- .1 Coatings: Ready mixed, except field catalyzed coatings. Process pigments to a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating; good flow and brushing properties; capable of drying or curing free of streaks or sags.
- .2 Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified, of commercial quality.
- .3 Patching Materials: Latex filler.
- .4 Fastener Head Cover Materials: Latex filler.

## 2.3 FINISHES

- .1 Refer to Room Finish Plan surface finish and colour.

## Part 3 Execution

### 3.1 EXAMINATION

- .1 Section 01 10 00: Verify existing conditions before starting work.
- .2 Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- .3 Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- .4 Test shop applied primer for compatibility with subsequent cover materials.
- .5 Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
  - .1 Plaster and Gypsum Wallboard: 12%.
  - .2 Masonry, Concrete, and Concrete Unit Masonry: 12%.
  - .3 Interior Wood: 15%.
  - .4 Exterior Wood: 15%.
  - .5 Concrete Floors: 8%.

### 3.2 PREPARATION

- .1 Mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.
- .2 Correct defects and clean surfaces which affect work of this section. Remove existing coatings that exhibit loose surface defects.
- .3 Seal with shellac and seal marks which may bleed through surface finishes.
- .4 Impervious Surfaces: Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- .5 Aluminum Surfaces Scheduled for Paint Finish: Remove surface contamination by steam or high pressure water. Remove oxidation with acid etch and solvent washing. Apply etching primer immediately following cleaning.
- .6 Insulated Coverings: Remove dirt, grease, and oil from canvas and cotton.

- 
- .7 Concrete Floors: Remove contamination; acid etch, and rinse floors with clear water. Verify required acid-alkali balance is achieved. Allow to dry.
  - .8 Copper Surfaces Scheduled for a Paint Finish: Remove contamination by steam, high pressure water, or solvent washing. Apply vinyl etch primer immediately following cleaning.
  - .9 Copper Surfaces Scheduled for a Natural Oxidized Finish: Remove contamination by applying oxidizing solution of copper acetate and ammonium chloride in acetic acid. Rub on repeatedly for required effect. Once attained, rinse surfaces with clear water and allow to dry.
  - .10 Gypsum Board Surfaces: Fill minor defects with filler compound. Spot prime defects after repair.
  - .11 Galvanized Surfaces: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.
  - .12 Concrete and Unit Masonry Surfaces Scheduled to Receive Paint Finish: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.
  - .13 Plaster Surfaces: Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.
  - .14 Uncoated Steel and Iron Surfaces: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by power tool wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Spot prime paint after repairs.
  - .15 Shop Primed Steel Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.
  - .16 Interior Wood Items Scheduled to Receive Paint Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats.
  - .17 Interior Wood Items Scheduled to Receive Transparent Finish: Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lightly between coats.
  - .18 Exterior Wood Scheduled to Receive Paint Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior calking compound after prime coat has been applied.
  - .19 Exterior Wood Scheduled to Receive Transparent Finish: Remove dust, grit, and foreign matter; seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes with tinted exterior calking compound after sealer has been applied.
  - .20 Glue-Laminated Beams: Prior to finishing, wash surfaces with solvent, remove grease and dirt.
  - .21 Wood and Metal Doors Scheduled for Painting: Seal top and bottom edges with primer.

### 3.3 APPLICATION

- .1 Apply products to manufacturer's written instructions.
- .2 Do not apply finishes to surfaces that are not dry.
- .3 Apply each coat to uniform finish.
- .4 Apply each coat of paint slightly darker than preceding coat unless otherwise approved.

- 
- .5 Sand metal and wood surfaces lightly between coats to achieve required finish.
  - .6 Vacuum clean surfaces free of loose particles. Use tack cloth just prior to applying next coat.
  - .7 Allow applied coat to dry before next coat is applied.
  - .8 Where clear finishes are required, tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.
  - .9 Prime concealed surfaces of woodwork with primer paint.
  - .10 Prime concealed surfaces of interior woodwork scheduled to receive stain or varnish finish with gloss varnish reduced 25% with mineral spirits.

### **3.4 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT**

- .1 Refer to Section 20 05 10 and Section 26 05 00 for schedule of colour coding and identification banding of equipment, duct work, piping, and conduit.
- .2 Paint shop primed equipment.
- .3 Remove unfinished louvres, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- .4 Prime and paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, except where items are prefinished.
- .5 Paint interior surfaces of convector and baseboard heating cabinets that are visible through grilles and louvres with one (1) coat of flat black paint, to visible surfaces. Paint dampers exposed behind convector and baseboard heating cabinets, louvres, and grilles to match face panels.
- .6 Paint exposed conduit and electrical equipment occurring in finished areas.
- .7 Paint both sides and edges of plywood backboards for electrical and telephone (1) equipment before installing equipment.
- .8 Colour code equipment, piping, conduit, and exposed duct work in accordance with requirements indicated. Colour band and identify with names, numbering and flow arrows.
- .9 Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

### **3.5 FIELD QUALITY CONTROL**

- .1 Test questionable coated areas prior to application.
- .2 Arrange for periodic visits to site by paint manufacturers' representatives while painting and finishing applications are in progress. On each visit he shall verify that specified materials and methods are used, and that procedures agreed upon at the initial site meeting are followed.
- .3 Manufacturers' representatives shall submit reports of each site visit to the Consultant.

### **3.6 CLEANING**

- .1 Section 01 74 00: Cleaning installed work.
- .2 Collect waste material which may constitute a fire hazard, place in closed metal containers and remove daily from site.

### **3.7 SCHEDULE - INTERIOR SURFACES**

- .1 Concrete, Concrete Block:
  - .1 One (1) coat of block filler.

- .2 One (1) coat of primer sealer latex.
- .3 Two (2) coats One (1) coat of latex, flat.
- .2 Steel - Unprimed:
  - .1 One (1) coat of latex primer.
  - .2 Two (2) coats of latex enamel, semi-gloss.
- .3 Steel - Primed:
  - .1 Touch-up with latex primer.
  - .2 Two (2) coats of latex enamel, semi-gloss.
- .4 Steel - Galvanized:
  - .1 One (1) coat galvanize primer.
  - .2 Two (2) coats of latex enamel, semi-gloss.
- .5 Plaster, Gypsum Board:
  - .1 One (1) coat of latex primer sealer.
  - .2 Two (2) coats of latex enamel, eggshell.
- .6 Fire Retardant Finish.
  - .1 One (1) coat of fire retardant primer.
  - .2 Two (2) coats of fire retardant finish, gloss.
  - .3 Flame and smoke rating of 25/5.

**END OF SECTION**

**Part 1 GENERAL**

- 1.1 SECTION INCLUDES
- 1.2 RELATED SECTIONS
- 1.3 REFERENCES
- 1.4 ADMINISTRATIVE REQUIREMENTS
- 1.5 SUBMITTALS FOR REVIEW
- 1.6 SUBMITTALS FOR INFORMATION
- 1.7 CLOSEOUT SUBMITTALS
- 1.8 DELIVERY, STORAGE, AND PROTECTION
- 1.9 WARRANTY

**Part 2 PRODUCTS**

- 2.1 GLASS MARKER BOARD MATERIALS
- 2.2 TACKABLE SURFACE MATERIAL
- 2.3 ACCESSORIES

**Part 3 EXECUTION**

- 3.1 EXAMINATION
- 3.2 INSTALLATION
- 3.3 CLEANING
- 3.4 PROTECTION OF FINISHED WORK

## **PART 1 GENERAL**

### **1.1 SECTION INCLUDES**

- .1 Marker boards.
- .2 Tackable surfaces.
- .3 Accessories.

### **1.2 RELATED SECTIONS**

- .1 Section 09 21 16 - Gypsum Board Assemblies: Preparation of substrate and adjacent work to receive work of this section.
- .2 Section 05 50 00 – Metals Fabrication: provision of in-wall sheet metal backing for work of this section.
- .3 Section 06 10 13 - Wood Blocking and Curbing.

### **1.3 REFERENCES**

- .1 AHA A135.4-2004 - Basic Hardboard.
- .2 NPA A208.1-2009 - Particleboard.
- .3 APA (American Plywood Association) - Construction and Industrial Plywood.
- .4 ASTM A123/A123M-09 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- .5 ASTM A424/A424M-09a - Standard Specification for Steel, Sheet, for Porcelain Enameling.
- .6 ASTM A653/A653M-10 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .7 ASTM B209-07 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- .8 ASTM B209M-07 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- .9 ASTM B211-03 - Standard Specification for Aluminum and Aluminum-Alloy Bar, Rod, and Wire.
- .10 ASTM B211M-03 - Standard Specification for Aluminum and Aluminum-Alloy Bar, Rod, and Wire.
- .11 ASTM C208-08a - Standard Specification for Cellulosic Fiber Insulating Board.
- .12 ASTM C1396/C1396M-09a - Standard Specification for Gypsum Board.
- .13 ASTM E84-10b - Standard Test Method for Surface Burning Characteristics of Building Materials.
- .14 CAN/CGSB 11.3-M87 - Hardboard.
- .15 CANPLY (Canadian Plywood Association) - Canadian Plywood Handbook.
- .16 CAN/ULC-S102-10 - Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
- .17 CAN/ULC S706-09 - Standard for Wood Fibre Insulating Boards for Buildings.
- .18 CHPVA (Canadian Hardwood Plywood and Veneer Association) - Official Grading Rules for Canadian Hardwood Plywood-2010.



- .19 PEI (Porcelain Enamel Institute) - Specifications for Porcelain Enamel Marker Boards and Chalkboards.

#### 1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Section 01 31 00: Project management and coordination procedures.
- .2 Coordination:
  - .1 Coordinate with other work having a direct bearing on work of this section.
  - .2 Coordinate the Work with installation of wall outlets and switches that are within the wall space for Work of this section.

#### 1.5 SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide data on glass marker boards, trim and accessories, and tackable surfaces.
- .3 Shop Drawings: Indicate wall elevations, dimensions, joint locations, and special anchor details.
- .4 Samples: Submit two (2) samples 12"x12" in size illustrating materials and finish, colour and texture of tackable surface.

#### 1.6 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special installation requirements.

#### 1.7 CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.

#### 1.8 DELIVERY, STORAGE, AND PROTECTION

- .1 Section 01 61 00: Transport, handle, store, and protect products.
- .2 Protect pre-finished surfaces with wrapping.

#### 1.9 WARRANTY

- .1 Section 01 78 10: Warranties.
- .2 Provide a five (5) year warranty to include coverage for failure to meet specified requirements for tackable surface material.
- .3 Warranty: Include coverage of marker board surfaces from crazing or cracking, staining and discolouration due to cleaning.

### PART 2 PRODUCTS

#### 2.1 GLASS MARKER BOARD MATERIALS

- .1 Product: Magnetic Glass Markerboards w/ invisimount.
- .2 Glass: 1/4" tempered glass, low iron, with polished edges. Back-painted in white with fade, water and heat resistant paint.

- .3 Mounting: Invisi-mount or concealed mounting hardware.
- .4 Sizes:
  - .1 Type "MB-3624": 36"W x 24"H
- .5 Accessories: One (1) marker tray and four (4) magnets per board.

## 2.2 TACKABLE SURFACE MATERIAL

- .1 Product: Forbo Bulletin Board material, conforming to the following:
  - .1 Total Thickness: 1/4 inch.
  - .2 Total Weight: 4.7kg/sq m.
  - .3 Roll Width: 48 inches
  - .4 Style/Colour: 2162 Duck Egg

## 2.3 ACCESSORIES

- .1 Adhesives: Type recommended by manufacturer, low odour.
- .2 Temporary Protective Cover: Sheet polyethylene.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify dimensions, tolerances, and method of attachment with other work.
- .3 Verify that internal wall sheet metal backing is ready to receive work and positioning dimensions are as indicated on Shop Drawings.
- .4 Verify flat wall surface for frame-less adhesive applied type.

### 3.2 INSTALLATION

- .1 Install tack surface and glass marker boards to manufacturer's written instructions.
- .2 Install products at height indicated on drawings.
- .3 Secure units level and plumb.
- .4 Carefully cut holes in tackable surfaces material for thermostats, wall switches, and receptacles.

### 3.3 CLEANING

- .1 Section 01 74 00: Cleaning installed work.
- .2 Remove protective material from surfaces.
- .3 Remove temporary protective cover at date of Substantial Completion.

### 3.4 PROTECTION OF FINISHED WORK

- .1 Section 01 78 40: Protecting installed work.
- .2 Protect finished Work from damage.

END OF SECTION

**PART 1 GENERAL**

- 1.1 SECTION INCLUDES
- 1.2 REFERENCES
- 1.3 SUBMITTALS FOR REVIEW
- 1.4 SUBMITTALS FOR INFORMATION
- 1.5 CLOSEOUT SUBMITTALS
- 1.6 QUALITY ASSURANCE
- 1.7 REGULATORY REQUIREMENTS
- 1.8 DELIVERY, STORAGE, AND PROTECTION
- 1.9 ENVIRONMENTAL REQUIREMENTS

**PART 2 PRODUCTS**

- 2.1 MANUFACTURERS
- 2.2 ACRYLIC SIGNS

**PART 3 EXECUTION**

- 3.1 EXAMINATION
- 3.2 INSTALLATION
- 3.3 SCHEDULES

## **PART 1 GENERAL**

### **1.1 SECTION INCLUDES**

- .1 Wall mounted acrylic signs
- .2 Design/development of graphics and digital prints.

### **1.2 REFERENCES**

- .1 Applicable Building Code: Accessibility guidelines.

### **1.3 SUBMITTALS FOR REVIEW**

- .1 Section 01 33 00: Submission procedures.
- .2 Shop Drawings: Indicate sign styles, lettering font, foreground and background colours, locations, overall dimensions of each sign.
- .3 Samples: Submit two (2) sample signs, 6" square illustrating type, style, letter font, and colours specified; method of attachment.

### **1.4 SUBMITTALS FOR INFORMATION**

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special installation requirements. Include installation template and attachment devices.

### **1.5 CLOSEOUT SUBMITTALS**

- .1 Section 01 78 10: Submission procedures.

### **1.6 QUALITY ASSURANCE**

- .1 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years of experience.

### **1.7 REGULATORY REQUIREMENTS**

- .1 Conform to applicable code for requirements for the physically handicapped.

### **1.8 DELIVERY, STORAGE, AND PROTECTION**

- .1 Section 01 61 00: Transport, handle, store, and protect products.
- .2 Package signs, labeled in name groups.
- .3 Store adhesive attachment tape at ambient room temperatures.

### **1.9 ENVIRONMENTAL REQUIREMENTS**

- .1 Section 01 35 26: Environmental conditions affecting products on site.
- .2 Do not install signs when ambient temperature is lower than recommended by manufacturer.
- .3 Maintain this minimum temperature during and after installation of signs.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURERS**

- .1 Displays2Go; Product: Workshop Series 6"x6" wall sign (DSIGN66UV)
- .2 Substitutions: Refer to Section 01 62 00.

### **2.2 ACRYLIC SIGNS**

- .1 Sign Material: Clear acrylic plastic plates with stainless steel standoffs.
  - .1 Acrylic Plate Colour: Clear. Green edge not permitted.
  - .2 Sign Contents: Content will be provided by Consultant to be printed on UV printed graphics. Allow for 3 colours.
  - .3 Sign Content Colour: To be printed in contrasting colour as selected by Architect
  - .4 Sign Media: Clear/frosted vinyl with digital UV printing, applied on acrylic.
  - .5 Overall Dimensions: 6" x 6" x 1"
  - .6 Standoff Material: stainless steel, brushed finish.
  - .7 Character Font: To be selected by Architect.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify that substrate surfaces are ready to receive work.

### **3.2 INSTALLATION**

- .1 Install signage to manufacturer instructions.
- .2 Install signs after surfaces are finished, in locations indicated.
- .3 Position sign plumb to wall and level.

### **3.3 SCHEDULES**

- .1 Patient Bed No. and Phone Extensions Signs: Provide one sign per bed.

**END OF SECTION**

**PART 1 GENERAL**

- 1.1 SECTION INCLUDES
- 1.2 RELATED SECTIONS
- 1.3 REFERENCES
- 1.4 SYSTEM DESCRIPTION
- 1.5 PERFORMANCE REQUIREMENTS
- 1.6 SUBMITTALS FOR REVIEW
- 1.7 SUBMITTALS FOR INFORMATION
- 1.8 CLOSEOUT SUBMITTALS
- 1.9 MAINTENANCE MATERIAL SUBMITTALS
- 1.10 REGULATORY REQUIREMENTS
- 1.11 DELIVERY, STORAGE, AND PROTECTION

**PART 2 PRODUCTS**

- 2.1 MANUFACTURERS
- 2.2 TRACK MATERIALS
- 2.3 CURTAIN MATERIALS
- 2.4 FABRICATION

**PART 3 EXECUTION**

- 3.1 EXAMINATION
- 3.2 INSTALLATION

## **PART 1 GENERAL**

### **1.1 SECTION INCLUDES**

- .1 Overhead metal curtain track and guides.
- .2 Curtains.

### **1.2 RELATED SECTIONS**

- .1 Section 05 50 00 - Metal Fabrications: Above ceiling supports for track.
- .2 Section 06 10 13 - Wood Blocking and Curbing: Above ceiling supports for track.
- .3 Section 08 21 16 – Gypsum Board Assembles.
- .4 Section 09 51 13 - Acoustical Panel Ceilings: Suspended ceiling system to support track.

### **1.3 REFERENCES**

- .1 ASTM E84-10b - Standard Test Method for Surface Burning Characteristics of Building Materials.
- .2 CAN/ULC-S102-10 - Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
- .3 NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films, 2010 Edition.
- .4 ULC - Fire Resistance Directory.
- .5 UL - Fire Resistance Directory.

### **1.4 SYSTEM DESCRIPTION**

- .1 Track: Surface mounted.

### **1.5 PERFORMANCE REQUIREMENTS**

- .1 Track and Mounting: Sufficiently rigid to resist visible deflection and without permanent set.

### **1.6 SUBMITTALS FOR REVIEW**

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide data for curtain fabric characteristics.
- .3 Shop Drawings: Indicate a dimensioned reflected ceiling plan view of curtain track, hangers and suspension points, attachment details, schedule of curtain sizes include mesh height.
- .4 Samples:
  - .1 Submit two (2) fabric samples, 8"x11" in size illustrating fabric colour.
  - .2 Submit two (2) fabric samples, 8"x11" in size illustrating mesh colour and size.
  - .3 Submit 12"x12" sample patch of curtain cloth with representative hem stitch detail, heading with reinforcement, and carrier attachment to curtain header.
  - .4 Submit 12" sample length of curtain track including typical splice, wall and ceiling hanger and escutcheon, end caps and brackets.



## 1.7 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special installation requirements including special procedures, and perimeter conditions requiring special attention.

## 1.8 CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.
- .2 Operation and Maintenance Data: Include recommended cleaning methods and materials and stain removal methods.

## 1.9 MAINTENANCE MATERIAL SUBMITTALS

- .1 Section 01 78 40: Maintenance and extra material requirements.
- .2 Extra Stock Materials:
  - .1 Provide fifteen (30) extra carriers.

## 1.10 REGULATORY REQUIREMENTS

- .1 Conform to Ontario Building Code for flame/smoke rating requirements in accordance with CAN/ULC-S102 for curtain fabric.

## 1.11 DELIVERY, STORAGE, AND PROTECTION

- .1 Section 01 61 00: Transport, handle, store, and protect products.
- .2 Accept curtain materials on site and inspect for damage.
- .3 Store curtain materials on site and deliver to the Owner for installation when requested.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- .1 KN Crowder; Product: Cubicle Track.
- .2 Other acceptable manufacturers offering functionally and aesthetically equivalent products.
  - .1 Construction Specialties; Product: CS Cubicle Curtains 6062N
  - .2 Inpro Corp; Product: Ultra Cube Cubicle Track.
- .3 Substitutions: Refer to Section 01 25 00.

### 2.2 TRACK MATERIALS

- .1 Track: Extruded aluminum sections, powder coat finish, white.
- .2 Curtain Carriers: Nylon roller to accurately fit track; Quiet and noiseless operation; designed to eliminate bind when curtain is pulled; fitted to curtain to prevent accidental curtain removal; 2.2 carriers per lineal foot of track length, plus one extra carrier. Designed to break away from axle at 22 pounds of applied pressure.
- .3 Wand: 48" hollow section, attached to lead carrier, for pull-to-close action.

### 2.3 CURTAIN MATERIALS

- .1 Product: Nexus-Nexus w/ dual side prints.

- .2 Composition: 55% Recycled Polyester, 45% Polyester FR
- .3 Curtain Face Pattern/Colour: Nexus / Stone
- .4 Curtain Back Pattern/Colour: Nexus / Stone
- .5 Basecloth: Greenway
- .6 Design layout: All over, reversible.
- .7 Open Mesh Cloth: open weave to permit sprinkler system to properly disperse water through area, as well as for air circulation; flameproof material. Coral – Carnival Net III (100% Nylon) – Natural.

## 2.4 FABRICATION

- .1 Manufacture curtains of one piece, sized 15% wider than track length. Terminate curtain 12" from floor.
- .2 Include open mesh cloth at top 20" of curtain for room air circulation and sprinkler coverage.
- .3 Curtain Heading: Triple thickness 2 inches wide, with metal grommet holes for carriers spaced at 6 inches on centre, double fold bottom hem 2 inches wide including lead weights. Lock stitch seams in two rows. Turn seam edges and lock stitch.
- .4 Fabricate track bend with minimum 12 inch radius, without deforming track section, or impeding movement of carriers.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify that field measurements are as indicated on Shop Drawings.
- .3 Verify that surfaces and above ceiling supports are ready to receive work.

### 3.2 INSTALLATION

- .1 Install curtain track to manufacturer's written instructions.
- .2 Install curtain track secure and rigid, true to ceiling line.
- .3 Install stop devices and end caps.
- .4 Secure track to ceiling system.
- .5 Install curtains on carriers ensuring smooth operation.

**END OF SECTION**

**PART 1 GENERAL**

- 1.1 SECTION INCLUDES
- 1.2 RELATED SECTIONS
- 1.3 REFERENCES
- 1.4 PERFORMANCE REQUIREMENTS
- 1.5 ADMINISTRATIVE REQUIREMENTS
- 1.6 SUBMITTALS FOR REVIEW
- 1.7 SUBMITTALS FOR INFORMATION
- 1.8 CLOSEOUT SUBMITTALS
- 1.9 QUALITY ASSURANCE

**PART 2 PRODUCTS**

- 2.1 MANUFACTURERS
- 2.2 COMPONENTS
- 2.3 FABRICATION

**PART 3 EXECUTION**

- 3.1 EXAMINATION
- 3.2 INSTALLATION
- 3.3 ERECTION TOLERANCES - HORIZONTAL RAILS

## **PART 1 GENERAL**

### **1.1 SECTION INCLUDES**

- .1 Crash rails.
- .2 Corner guards.
- .3 Protective wall coverings.

### **1.2 RELATED SECTIONS**

- .1 Section 05 50 00 - Metal Fabrications: Concealed in wall plates and anchors for attachment of work of this section.
- .2 Section 06 41 11 – Architectural Cabinet: Adjacent finish.
- .3 Section 09 21 16 - Gypsum Board Assemblies: Adjacent wall finish.

### **1.3 REFERENCES**

- .1 CAN/CSA-B651-04 (R2010) - Accessible Design for the Built Environment.
- .2 CAN/ULC S102.2 – Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies.

### **1.4 PERFORMANCE REQUIREMENTS**

- .1 Installed Crash Rail Component Assembly: Support a concentrated load not less than 0.9 kN applied at any point and in any direction for all handrails, and a uniform load not less than 0.7 kN/m applied in any direction with deflection not to exceed 1/50 of span between supports.
- .2 Corner Guards: Resist lateral impact force of 100 lbs at any point without damage or permanent set.

### **1.5 ADMINISTRATIVE REQUIREMENTS**

- .1 Section 01 31 00: Project management and coordination procedures.
- .2 Coordination:
  - .1 Coordinate with other work having a direct bearing on work of this section.
  - .2 Coordinate the work with wall or partition sections for installation of concealed blocking or anchor devices.

### **1.6 SUBMITTALS FOR REVIEW**

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Indicate physical dimensions, features, finish texture, colour, anchorage/mounting details.
- .3 Samples: Submit two (2) sections of crash rail and corner guard, 24 inch long, illustrating component design, configuration, colour, texture and finish.
- .4 Samples: Submit two (2) sheets of wall protection 8"x11", illustrating thickness, colour, texture and finish.

## 1.7 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special installation requirements including special procedures, and perimeter conditions requiring special attention.

## 1.8 CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.

## 1.9 QUALITY ASSURANCE

- .1 Perform Work to CAN/CSA-B651 requirements for the physically handicapped.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- .1 Construction Specialties;
- .2 Substitutions: Refer to Section 01 25 00.

### 2.2 COMPONENTS

- .1 Crash Rail (CR): Preformed, return-to-wall end caps, internal and external corners:
  - .1 Product: HRB-20N.
  - .2 Material: Acrovyn Chameleon simulated wood on aluminum retainer.
  - .3 Mounting: Surface.
  - .4 Projection From Wall to Outside of Rail: 3.75 inches (International Offset).
  - .5 Clear Space From Wall: 2.25 inches (International Offset).
  - .6 Length: Minimum one piece length not less than 24 inches; flush splicing.
  - .7 Finish: 653 Ebony Walnut
- .2 Corner Guard at 90 degrees (CG) - Surface Mounted:
  - .1 Product: CO-8 at 90 degrees.
  - .2 Material: Type 304 Stainless steel with No. 4 finish
  - .3 Mounting: Adhesive.
  - .4 Leg size: 3.5"
  - .5 Length: 6'-10" to match top of door frame, unless noted otherwise. One (1) continuous piece.
- .3 Corner Guard Custom Angles (CG-C) - Surface Mounted:
  - .1 Product: ACO-8M at angles to suit site condition.
  - .2 Material: Clear anodized aluminum
  - .3 Mounting: Adhesive.
  - .4 Leg size: 3.5"
  - .5 Length: 6'-10" to match top of door frame, unless noted otherwise. One (1) continuous piece.
- .4 End-wall Corner Guard (CG-E) - Surface Mounted:
  - .1 Product: SCO-8

- .2 Material: Type 304 Stainless steel with No. 4 finish
- .3 Mounting: Adhesive.
- .4 Throat size: Custom to suit wall thickness
- .5 Length: 6'-10" to match top of door frame, unless noted otherwise. One (1) continuous piece.
- .5 Protective Wall Covering (PWC-) – Surface Mounted:
  - .1 Product: Acrovyn 4000 high-impact wall covering sheet.
  - .2 Material: Vinyl/Acrylic.
  - .3 Thickness: 0.060"
  - .4 Mounting: Adhesive.
  - .5 Size: Minimum one piece length not less than 24 inches; colour-matched caulked vertical flushed joints, with colour-matched top and corner caps.
  - .6 Flame spread rating: 25 or less
  - .7 Smoke Developed Classification: 450 or less
  - .8 Colour/Texture:
    - .1 PWC-1: 209 Slate/Irish Linen
    - .2 PWC-2: 949 White/Suede
    - .3 PWC-3: 314 Ozark/Suede
- .6 Mounting Brackets and Attachment Hardware: Appropriate to component and substrate.

## 2.3 FABRICATION

- .1 Fabricate components with tight joints, corners and seams.
- .2 Pre-drill holes for attachment.
- .3 Form end trim closure by capping and finishing smooth.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify that metal in-wall backings for components are correctly sized and located.

### 3.2 INSTALLATION

- .1 Install components to manufacturer's written instructions.
- .2 Install components level and plumb, secured rigidly in position to wall framing members only.
- .3 Position top of crash rail to match existing height.
- .4 Position corner guard above wall base (4" a.f.f.).
- .5 Position protective wall covering above wall base (4" a.f.f.).
- .6 Terminate crash rails 4" short of outside wall corners receiving corner guards (1/2" from corner guards), 4" short of inside corners, and 2" short of door and window frames,
- .7 Return rails to be 1/2" clear of wall.
- .8 Coordinate installation of protective wall covering and crash rail with corner guard.

### **3.3 ERECTION TOLERANCES - HORIZONTAL RAILS**

- .1 Section 01 73 00: Tolerances.
- .2 Maximum Variation From Required Height: 1/8 inch.
- .3 Maximum Variation From Level or Plane For Visible Length: 1/4 inch.

**END OF SECTION**

**PART 1 GENERAL**

- 1.1 SECTION INCLUDES
- 1.2 RELATED SECTIONS
- 1.3 REFERENCES
- 1.4 ADMINISTRATIVE REQUIREMENTS
- 1.5 SUBMITTALS FOR REVIEW
- 1.6 SUBMITTALS FOR INFORMATION
- 1.7 CLOSEOUT SUBMITTALS
- 1.8 REGULATORY REQUIREMENTS

**PART 2 PRODUCTS**

- 2.1 MATERIALS
- 2.2 FABRICATION
- 2.3 FINISHES

**PART 3 EXECUTION**

- 3.1 EXAMINATION
- 3.2 PREPARATION
- 3.3 INSTALLATION
- [3.4 SCHEDULES](#)



## **PART 1 GENERAL**

### **1.1 SECTION INCLUDES**

- .1 Coat hook.
- .2 Coat rod.
- .3 Shoe rack.

### **1.2 RELATED SECTIONS**

- .1 Section 05 50 00 - Metal Fabrications: In wall framing and plates for support of accessories.

### **1.3 REFERENCES**

- .1 ASTM A123/A123M-12 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- .2 ASTM A167-99 (2009) - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- .3 ASTM A269-10 - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
- .4 ASTM A1008/A1008M-12a - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
- .5 ASTM B456-11e1 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
- .6 CSA-B651-12 - Accessible Design for the Built Environment.

### **1.4 ADMINISTRATIVE REQUIREMENTS**

- .1 Section 01 31 00: Project management and coordination procedures.
- .2 Coordination:
  - .1 Coordinate with other work having a direct bearing on work of this section.
  - .2 Coordinate the work with the placement of internal wall reinforcement to receive anchor attachments.

### **1.5 SUBMITTALS FOR REVIEW**

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide data on accessories describing size, finish, details of function, attachment methods.
- .3 Samples: Submit two (2) samples of coat hooks, illustrating colour and finish.

### **1.6 SUBMITTALS FOR INFORMATION**

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special installation requirements including special procedures, and perimeter conditions requiring special attention.

## 1.7 CLOSEOUT SUBMITTALS

- .1 Section 01 78 10: Submission procedures.

## 1.8 REGULATORY REQUIREMENTS

- .1 Conform to applicable code for accessibility requirements for the handicapped.

## PART 2 PRODUCTS

### 2.1 MATERIALS

- .1 Sheet Steel: ASTM A1008/A1008M.
- .2 Stainless Steel Sheet: Type 304.
- .3 Tubing: ASTM A269, stainless steel.
- .4 Adhesive: Contact type, waterproof.
- .5 Fasteners, Screws, and Bolts: Hot dip galvanized, tamper-proof.

### 2.2 FABRICATION

- .1 Weld and grind joints of fabricated components, smooth.
- .2 Form exposed surfaces from single sheet of stock, free of joints. Form surfaces flat without distortion. Maintain surfaces without scratches or dents.
- .3 Shop assemble components and package complete with anchors and fittings.
- .4 Provide steel anchor plates, adapters, and anchor components for installation.

### 2.3 FINISHES

- .1 Galvanizing: Hot-dip galvanized to appropriate grade for type and size of steel material indicated. Galvanize ferrous metal and fastening devices.
- .2 Shop Primed Ferrous Metals: Pre-treat and clean, spray apply one coat primer and bake.
- .3 Enamel: Pre-treat to clean condition, apply one (1) coat primer and minimum two (2) coats epoxy baked enamel.
- .4 Chrome/Nickel Plating: ASTM B456, Type SC 2, satin finish.
- .5 Stainless Steel: No. 4 Satin finish.
- .6 Back paint components where contact is made with building finishes to prevent electrolysis.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify that field measurements are as indicated on product data.
- .3 Verify that site conditions are ready to receive work and dimensions are as indicated on Shop Drawings and as instructed by the manufacturer.

- .4 Verify exact location of accessories for installation.

### 3.2 PREPARATION

- .1 Deliver inserts and rough-in frames to site for timely installation.
- .2 Provide templates and rough-in measurements as required.

### 3.3 INSTALLATION

- .1 Install accessories to manufacturer's written instructions.
- .2 Install plumb and level, securely and rigidly anchored to substrate.

### 3.4 SCHEDULES

- .1 Coat Hook: Stainless steel, single hook, with anti-bacterial finish.
  - .1 Manufacturer/Model:
    - .1 Richelieu 51128170AB
    - .2 ASI 7308
- .2 Coat Rod: 1 1/16" diameter, steel core with a stainless steel wrap finish, c/w mounting flanges. Provide intermediate support if rod is 60" or longer.
  - .1 Manufacturer/Model:
    - .1 Knape & Vogt KV660 SS
    - .2 Lido Designs LB-44-A106 SS
- .3 Shoe Rack: Clear anodized aluminum tubing with die cast brackets. End wall application.
  - .1 Manufacturer/Model:
    - .1 Bayco CL-40.

END OF SECTION

**PART 1 GENERAL**

- 1.1 SECTION INCLUDES
- 1.2 RELATED SECTIONS
- 1.3 SUBMITTALS
- 1.4 QUALITY ASSURANCE
- 1.5 PRE-INSTALLATION MEETINGS
- 1.6 DELIVERY, STORAGE, AND HANDLING
- 1.7 PROJECT CONDITIONS
- 1.8 SEQUENCING
- 1.9 WARRANTY

**PART 2 PRODUCTS**

- 2.1 MANUFACTURERS
- 2.2 HANGING AND DISPLAY SYSTEM (AD-)
- 2.3 DISPLAY ART RAIL (DR-)

**PART 3 EXECUTION**

- 3.1 EXAMINATION
- 3.2 PREPARATION
- 3.3 INSTALLATION
- 3.4 CLEANING
- 3.5 PROTECTION

## **PART 1 GENERAL**

### **1.1 SECTION INCLUDES**

- .1 Hanging or display systems including the following:
  - .1 Display Reveal System w/ Anti-theft Secure Rod (AD-1)
  - .2 Click Rail System w/ nylon cables (AD-2)
  - .3 Casso Display Rail II. (DR-)

### **1.2 RELATED SECTIONS**

- .1 Section 06 10 00 - Rough Carpentry.
- .2 Section 06 41 11 – Architectural Cabinetwork
- .3 Section 09 21 16 – Gypsum Board Assemblies.

### **1.3 SUBMITTALS**

- .1 Submit under provisions of Section 01 30 00 - Administrative Requirements.
- .2 Product Data: Manufacturer's data sheets on each product to be used, including:
  - .1 Preparation instructions and recommendations.
  - .2 Storage and handling requirements and recommendations.
  - .3 Installation methods.

### **1.4 QUALITY ASSURANCE**

- .1 Manufacturer Qualifications: Minimum 5 year experience manufacturing similar products.
- .2 Installer Qualifications: Minimum 2 year experience installing similar products.
- .3 Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
  - .1 Finish areas designated by Architect.
  - .2 Do not proceed with remaining work until workmanship is approved by Architect.
  - .3 Remodel mock-up area as required to produce acceptable work.

### **1.5 PRE-INSTALLATION MEETINGS**

- .1 Convene minimum two weeks prior to starting work of this section.

### **1.6 DELIVERY, STORAGE, AND HANDLING**

- .1 Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.
- .2 Handling: Handle materials to avoid damage.

### **1.7 PROJECT CONDITIONS**

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

## 1.8 SEQUENCING

- .1 Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

## 1.9 WARRANTY

- .1 Warranty: Submit manufacturer's standard limited one year warranty.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- .1 Acceptable Manufacturer: AS Hanging Display Systems, which is located at: 8396 State Route 9; West Chazy, NY 12992 ; Toll Free Tel: 866-935-6949 ; Email:request info (info@ashanging.com); Web:www.ashanging.com|www.ashanging.com/fr/
- .2 Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

### 2.2 HANGING AND DISPLAY SYSTEM (AD-)

- .1 Click Rail System as manufactured by AS Hanging Display Systems. Provide materials and components required to provide a complete system by AS Hanging Display Systems for hanging corporate branding, display materials, informational and directional signage, art, regulatory notices, with rigid track as indicated on.
  - .1 Configuration: Suspended Cable.
  - .2 Click Rail Track: Closed-face.
  - .3 Track Weight Capacity: minimum of 78 lb./6 foot track
  - .4 Vertical Component: Nylon cords.
- .2 Click Rail Wall Track: Aluminum.
  - .1 Finish: White, powder coated (AD-1).
  - .2 Finish: Honey Maple, faux wood finish (AD-2).
  - .3 Click Rail Track End Cap: To match track finish.
  - .4 Click Rail Track End Cap: To match track finish.
  - .5 Length: 48" (AD-1); AD-2 – To Suit width of millwork showcase
- .3 Vertical Component/Cable:
  - .1 Cord: Twist-End Transparent Nylon. (patented) Minimum weight capacity; 15 lbs.
  - .2 Cable (stainless)/Cord (Nylon) Length: 48 inches.
  - .3 Twist-End Cable Tensioner. (patented)
- .4 Hooks: Provide manufacturer's recommended type and quantity of hooks.

### 2.3 DISPLAY ART RAIL (DR-)

- .1 Casso Display Rail as manufactured by AS Hanging Display Systems. Features an internal wiper to grasp display papers. Display material inserts from below display rail.
  - .1 Material: Extruded aluminum.
  - .2 Bulletin bar/ display rail system that eliminates use of:
    - .1 Tacks, push pins, staples, and other fasteners for displayed items.

- .2 Rollers to hold displayed items (eliminates binding even with stapled items).
- .3 Hinge type mechanisms.
- .3 Extendable on both ends in a continuous installation.
- .4 End Caps: Matching finish of extrusion.
- .5 Readily accepts variable material thicknesses up to 2mm thick (mat board mounted art).
- .6 Mounting:
  - .1 Does not require direct fastening.
  - .2 May be mounted to gypsum board, plaster and lath, brick, concrete block, and a variety of other wall surfaces,
  - .3 May be mounted behind crown moldings, other finish carpentry, or other interior design features.
  - .4 Shall not have exposed fasteners.
  - .5 Shall not be drilled to receive fasteners.
  - .6 Fasteners and hardware shall be supplied for mounting.
- .7 Track Length:
  - .1 DR-18: 18 inches.
  - .2 DR-24: 24 inches.
  - .3 DR-36: 36 inches.
  - .4 DR-72: 72 inches.
- .8 Finish:
  - .1 Anodized, Silver Satin.

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION**

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

#### **3.2 PREPARATION**

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

#### **3.3 INSTALLATION**

- .1 Install in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.
- .2 Reveal Hanging and Display System: Review additional mounting and blocking requirements and verify that adequate blocking is provided.

#### **3.4 CLEANING**

- .1 Clean installed system and remove excess materials.
- .2 Deliver any unused cable and fittings to Owner.

### **3.5 PROTECTION**

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

**END OF SECTION**



**PART 1 GENERAL**

- 1.1 SECTION INCLUDES
- 1.2 RELATED SECTIONS
- 1.3 SYSTEM DESCRIPTION
- 1.4 SUBMITTALS FOR REVIEW
- 1.5 SUBMITTALS FOR INFORMATION
- 1.6 CLOSEOUT SUBMITTALS
- 1.7 QUALITY ASSURANCE
- 1.8 WARRANTY

**PART 2 PRODUCTS**

- 2.1 MANUFACTURERS
- 2.2 COMPONENTS
- 2.3 FABRICATION

**PART 3 EXECUTION**

- 3.1 EXAMINATION
- 3.2 INSTALLATION
- 3.3 INSTALLATION TOLERANCES
- 3.4 ADJUSTING
- 3.5 CLEANING
- 3.6 CLOSEOUT ACTIVITIES

## **PART 1 GENERAL**

### **1.1 SECTION INCLUDES**

- .1 Manual, chain-operated, horizontal window double roller shades, c/w solar shades and blackout shades.

### **1.2 RELATED SECTIONS**

- .1 Section 06 10 13: Wood blocking.

### **1.3 SYSTEM DESCRIPTION**

- .1 Provide for infinite positioning of window shade.
- .2 Noise reduction seals for sound isolation and absorption of mechanism noise.
- .3 Shade Orientation: Shade cloth to roll at window side of roller.
- .4 Degree of Openness: 0% blackout for blackout shade, 5% for solar shade
- .5 Provide for smooth and quiet operation.

### **1.4 SUBMITTALS FOR REVIEW**

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide manufacturer's data sheets describing components, accessories, dimensions, tolerances for window openings required, colours and textures.
- .3 Shop Drawings: Indicate dimensions in relation to window jambs, operator details, top rail, anchorage details, hardware and accessory details, conditions between adjacent blinds, corner conditions and required clearances.
- .4 Samples: Submit two (2) sets of 8.5x11 inch (216x280mm) fabric samples of each fabric specified. Indicating % of openness, colour, surface texture and sheen.

### **1.5 SUBMITTALS FOR INFORMATION**

- .1 Section 01 33 00: Submission procedures.

### **1.6 CLOSEOUT SUBMITTALS**

- .1 Section 01 77 00: Submission procedures.

### **1.7 QUALITY ASSURANCE**

- .1 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five (5) year experience.
- .2 Installer Qualifications: Company specializing in installation of the Products specified in this section with minimum five (5) year experience.

### **1.8 WARRANTY**

- .1 Section 01 00 00: Warranties.
- .2 Provide a five (5) year warranty to include coverage for failure to meet specified requirements for shading fabrics.

- .3 Provide a ten (10) year warranty to include coverage for failure to meet specified requirements for roller shade system.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- .1 Altex; Product: SunProject, Moduline Lite-Lift Dual chain operated roller system, with “L” angle to reduce light gaps, noted on drawings as “RSH”.
- .2 Other acceptable manufacturers offering functionally and aesthetically equivalent products.
  - .1 Hunter Douglas; Product: Manual RB500 Dual Roller Shades.
  - .2 Solarfective; Product: Manual Double Teleshade System Shade

### 2.2 COMPONENTS

- .1 Horizontal Shade Band:
  - .1 Assembly: Fabric, concealed hem bar, attachment of shade bands to roller tube.
  - .2 Solar Fabric: Altex – ecoSCREEN – TexLucent Eco 1699, or alternate approved by Consultant. PVC free, formaldehyde-free and lead-free. Antibacterial, antifungal, and flame resistant.
    - .1 Yarn: 100% polyester
    - .2 Openness Factor: 5% privacy weave
    - .3 Colour: Light Grey 1699-05.
  - .3 Blackout Fabric: ecoGLOBE or alternate approved by Consultant. PVC-free and lead-free. Antibacterial, antifungal, and flame resistant.
    - .1 Yarn: 100% polyester with acrylic backing (PVC free).
    - .2 Openness Factor: 0% Blackout
    - .3 Colour: Turtledove GL1658.
    - .4 Backing: white
- .2 Shade Roller Tube: Extruded aluminum, 50 mm (2 inch) diameter, with reinforced internal ribs to provide maximum span without tube deflection.
- .3 Concealed Hem Bar: Extruded aluminum in fabric hem pocket for uniform look.
- .4 Internal Tension Idler: Adjustable, to automatically control the amount of torque generated for constant smooth operation of the shade system, with automatic release during down-travel, and automatic engage during up-travel.
- .5 Chain Drive: Heavy duty, commercial grade sprocket, a planetary gear assembly for increased performance, speed ratio, smoothness, and balance to the chain and shade assembly. Each roller to operate independently of each other.
  - .1 Operating Chain: No.10, heavy duty stainless steel bead chain, 90 lb (40 kg) load test.
  - .2 Chain Hold Down: To fully secure shade to chain holder.
- .6 Mounting Brackets: 1/8inch (3mm) galvanized steel, snap on brackets for ceiling, wall, or recessed mount in ceiling. Bracket assembly to accept double rollers.
- .7 Closure Box: One piece extruded aluminum box, closed on all sides except bottom, c/w removable bottom closure.

- .8 Side Channel: L-shaped side channels to prevent light gaps at the side. Finish to match existing window mullion or closure box.

## 2.3 FABRICATION

- .1 Provide manual shade chain drive window shade, of:
  - .1 Tension activated lifting mechanism with multi-layer concentric constant tension.
  - .2 Lifting mechanism with a memory tension lock.
  - .3 Shade to not require re-tensioning after removal for cleaning.
  - .4 Internally free-floating mechanism along grooved non-corrosive shaft, and reversible for future alterations and maintenance.
- .2 Factory assemble in a one piece container, closed on all sides, with top, back, sides and bottom return of plastic injected-molded end caps.
- .3 Lifting mechanism to accommodate tension modules for maximum shade performance. Provide memory lock for tension modules to retain torque.
- .4 Mounting detail: Face/wall mounted recessed above ceiling snap in mount.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- .1 Section 01 10 00: Verify existing conditions before starting work.
- .2 Examine substrate and conditions for installation.
- .3 Beginning of installation means acceptance of substrate and project conditions.

### 3.2 INSTALLATION

- .1 Install units and their accessories to manufacturer's instructions.
- .2 Securely screw end plugs to conceal exposed cut aluminum of exterior hem bar.
- .3 Securely anchor units plumb and level, using hardware and accessories to provide smooth operation without binding.

### 3.3 INSTALLATION TOLERANCES

- .1 Maximum variation of gap at window opening perimeter: plus or minus 1/8 inch (3mm) of shade height.
- .2 Maximum offset from level: 1/8 inch (3mm).
- .3 Use manufacturer's edge clearance requirements for shades where the width-to-height ratio exceeds 1:3.

### 3.4 ADJUSTING

- .1 Adjust units for smooth operation.
- .2 Adjust shade and shade cloth to hang flat without waves, folds, or distortion.
- .3 Replace any units or components which do not hang properly or operate smoothly.

### 3.5 CLEANING

- .1 Section 01 74 13: Cleaning installed work.

- .2 Touch up damaged finishes and repair minor damage in a manner to eliminate evidence of repair. Remove and replace work that cannot be satisfactorily repaired.
- .3 Clean exposed surfaces and edges/ends, including metal and shade cloth, using non-abrasive materials and methods recommended by manufacturer. Remove and replace work which cannot be satisfactorily cleaned.

### **3.6 CLOSEOUT ACTIVITIES**

- .1 Demonstration: Demonstrate operation method and instruct Owner's personnel in the proper operation and maintenance of the window shade assembly.

**END OF SECTION**